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Home Page: www.mactec.com

To:

Steve Morrow

From:

Chris Ricardi April 8, 2010

Date:

Subject: Interim Response Steps Work Plan Slurry Wall Monitoring Program 4Q09- November

2009

DATA VALIDATION REPORT
NOVEMBER 2009 SLURRY WALL SURFACE WATER AND GROUNDWATER
NOVEMBER 2009 SEDIMENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS
TestAmerica Laboratories Data Sets 360-25552-1, 360-25553-1 and 360-25577-1

### 1.0 INTRODUCTION

Groundwater samples, surface water, and sediment samples were collected from the Olin Chemical Superfund Site from November 9 to November 12, 2009. Samples were analyzed by TestAmerica Laboratories in Westfield, Massachusetts. Data were reported in sample delivery groups (SDGs) 360-25552, 360-25553 and 360-25577. A summary of samples included in this review is contained in Table 1. Samples reviewed in this report were analyzed for the following USEPA SW-846 (USEPA, 1996), USEPA wastewater (USEPA, 1993), or Standard Methods (APHA, 1995):

- dissolved metals (aluminum and chromium) by USEPA Method 6010B in groundwater
- dissolved and total metals (aluminum, chromium, and sodium) by USEPA Method 6010B in surface water
- total metals (aluminum, chromium, and sodium) by USEPA Method 6010B in sediment
- general chemistry analyses for ammonia by USEPA Method 350.1 (Lachat 10-107-06-1), chloride, sulfate, nitrate, and nitrite by USEPA Method 300, and specific conductance by SM18 SM 2510B

The Draft Interim Response Steps Work Plan (MACTEC, 2007) and the MassDEP Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP) [MassDEP, 2004] were used as references during the review. Analytical packages were reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington annual and quarterly groundwater monitoring tasks. Final sample results are presented on data summaries in Table 2.

### 2.0 METALS

Data were reviewed for the following parameters:

- Data Completeness
- \* Holding Time
  - Blanks
- \* Matrix Spike Analysis
- Field Duplicate Results



- \* Laboratory Control Sample/Laboratory Control Sample Duplicate Analysis
- \* Detection Limits
  Dissolved vs. Total Metals Comparison
- \* = indicates that criteria were met for this parameter

### Blanks

The laboratory qualified sample results for iron with a (B) indicating it was detected in the sample and associated method blank in sediment SDG 360-25553. The concentrations in all samples were much higher than concentration in the blank, and the B qualifiers were removed from iron results in the final data set.

### Dissolved vs. Total Metals Comparison

Dissolved sodium concentrations are significantly greater than total sodium concentrations reported in a subset of surface water samples in SDG 360-25577. The results for total and dissolved sodium in samples OC-SW-ISCO1, OC-SW-ISCO2, OC-SW-ISCO3, OC-SW-PZ16RR, OC-SW-PZ17RR, OC-SW-18R, and OC-SW-18R-DUP were qualified estimated J.

### 3.0 GENERAL CHEMISTRY – Ammonia, Chloride, Sulfate, Nitrate, Nitrite, and Specific Conductance

Data were reviewed for the following parameters:

- Data Completeness
- \* Holding Time
- \* Blanks
  - Matrix Spike Analysis
- \* Laboratory Duplicate Analysis
- \* Laboratory Control Sample/Laboratory Control Sample Duplicate Analysis Detection Limits
- \* = indicates that criteria were met for this parameter

### Matrix Spike Analysis

An ammonia MS/MSD analysis was completed using sample OC-SW-18R. The ammonia MS percent recovery (55) is below than the project limit of 75 percent. The MSD recovery was within limits indicating variability of recovery was observed. The results for ammonia in all surface water samples were qualified estimated (J).

### **Detection Limits**

The reporting limits for nitrite in samples OC-SW-PZ16RR, OC-SW-PZ17RR, and OC-SW-SD17 are elevated above the project goal of 0.01 mg/L to 0.1 mg/L due to a 10X dilution.

Except for the validation actions noted above, the results are interpreted to be usable as reported by TestAmerica.



Chris Ricards	4/8/10
Chris Ricardi, NRCC-EAC Senior Chemist	Date
My Muyly Michael Murphy Project Principal	$\frac{4/21/10}{Date}$

### References:

- American Public Health Association (APHA), 1995. "Standard Methods for Examination of Water and Wastewater"; 19th Edition; APHA, 1015 Fifteenth St., NW. Washington, D.C. 20005.
- MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site; 51 Eames Street, Wilmington, Massachusetts; July 25, 2007.
- Massachusetts Department of Environmental Protection (MassDEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.
- U.S. Environmental Protection Agency (USEPA), 1993. "Methods for Chemical Analysis and Water and Wastes (MCAWW)", EPA/600/4-79-020 (March 1983) with updates and supplements EPA/600/4-91-010 (June 1991), EPA/600/R-92-129 (August 1992) and EPA/600/R-93-100 (August 1993).
- U.S. Environmental Protection Agency (USEPA), 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 -December 1996.

### Table 1 Sample Summary - 360-25552-1, 360-25577-1, & 360-25553-1 Data Validation Report November 2009 Slurry Wall / Cap Groundwater, Surface Water and Sediment

November 2009 Slurry Wall / Cap Groundwater, Surface Water and Sedim Olin Chemical Superfund Site Wilmington, Massachusetts

360-25552-1 360-25552-1	GW-10S GW-201S	Sample ID OC-GW-10S	Sample Date		Filtered	10-107-06-1-B)	SM 2510B	300.0	E160.3
360-25552-1 360-25552-1 360-25552-1	GW-201S	OC CW 100			ACTUAL CONTRACTOR	3 0000000 00000 00000 0000 0000 0000 0		A Section Control	
360-25552-1	GW-201S	OC CW 100							
360-25552-1 360-25552-1 360-25552-1		OC-GM-102	11/10/2009		2	1	1	2	
	CHIL SCAD	OC-GW-201S	11/9/2009		2	1	1	2	
360-25552-1	GW-202D	OC-GW-202D	11/11/2009		2	1	1	2	
000-20002-1	GW-202S	OC-GW-202S	11/11/2009		2	1	1	2	
360-25552-1	GW-202S	OC-GW-202S DUP	11/11/2009		2	1	1	2	
360-25552-1	GW-24	OC-GW-24	11/10/2009		2	1	1	2	
360-25552-1	GW-25	OC-GW-25	11/10/2009		2	1	1	2	
360-25552-1	GW-26	OC-GW-26	11/10/2009		2	1	1	2	
360-25552-1	GW-34D	OC-GW-34D	11/11/2009		2	1	1	2	
360-25552-1	GW-34D	OC-GW-34D DUP	11/11/2009		2	1	1	2	
360-25552-1	GW-34SR	OC-GW-34SR	11/11/2009		2	1	1	2	
360-25552-1	GW-35S	OC-GW-35S	11/11/2009		2	1	1	2	
360-25552-1	GW-42S	OC-GW-42S	11/9/2009		2	1	1	2	
360-25552-1	GW-76S	OC-GW-76S	11/10/2009		2	1	1	2	
360-25552-1	GW-78S	OC-GW-78S	11/11/2009		2	1	1	2	
360-25552-1	GW-79S	OC-GW-79S	11/10/2009		2	1	1	2	
360-25552-1	GW-CA1	OC-GW-CA-1	11/11/2009		2	1	1	2	
360-25552-1	PZ-16RR	OC-PZ-16RR	11/10/2009		2	1	1	2	
360-25552-1	PZ-17RR	OC-PZ-17RR	11/10/2009		2	1	1	2	
360-25552-1	PZ-18R	OC-PZ-18R	11/10/2009		2	1	1	2	
Surface Water	12 1010	00121010	****						
360-25577-1	PZ-18R	OC-SW-18R	11/12/2009	3	3	1	1	4	
360-25577-1	PZ-18R	OC-SW-18R-DUP	11/12/2009	3	3	1	1	4	
360-25577-1	ISCO1	OC-SW-ISCO1	11/12/2009	3	3	1	1	4	
360-25577-1	ISCO2	OC-SW-ISCO2	11/12/2009	3	3	1	1	4	
360-25577-1	ISCO3	OC-SW-ISCO3	11/12/2009	3	3	1	1	4	
360-25577-1	PZ-16RR	OC-SW-PZ16RR	11/12/2009	3	3	1	1	4	
360-25577-1	PZ-17RR	OC-SW-PZ17RR	11/12/2009	3	3	1	1	4	
360-25577-1	SD-17	OC-SW-SD17	11/12/2009	3	3	1	1	4	
Sediment	30-17	00 511 5517	11/12/2007						
360-25553-1	SD-SD1	OC-SD-SD-SD1-0.0/0.5	11/11/2009	3					2
360-25553-1	SD-SD1	OC-SD-SD-SD1-0.0/0.5 DUP	11/11/2009	3					2
360-25553-1	SD-SD1	OC-SD-SD-SD2-0.0/0.5	11/11/2009	3					2
360-25553-1	SD-SD2 SD-SD3	OC-SD-SD-SD3-0.0/0.5	11/11/2009	3					2
360-25553-1	SD-SD3 SD-SD4	OC-SD-SD-SD4-0.0/0.5	11/11/2009	3					2
360-25553-1 360-25553-1	SD-SD4 SD-SD5	OC-SD-SD-SD5-0.0/0.5	11/11/2009	3					2

Notes:

Number listed under method indicates number of target analytes reported.

Prepared by / Date: KJC 11/30/09 Checked by / Date: CSR 3/23/10

			Loc Name	GW-	10S	GW-2	01S	GW-2	202D	GW-	202S	GW-2	202S	GW	-24	GW	/-25
			Field Sample ID	OC-GW	V-10S	OC-GW	-201S	OC-GV	/-202D	OC-GV	/-202S	OC-GW-2	02S DUP	OC-G	W-24	OC-G	W-25
			Field Sample Date	11/10	0/09	11/09	9/09	11/1	1/09	11/1	1/09	11/1	1/09	11/1	0/09	11/1	0/09
		QC Cod		FS	S	FS	3	F	S	F	S	F	D	F	S	F	S
		Lab Sample Delivery Group		360-25	552-1	360-25	552-1	360-25	552-1	360-25	5552-1	360-25	5552-1	360-25	5552-1	360-25	5552-1
Frac	Method	ethod Analyte Units		Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	NAME OF THE PARTY		4300		100	U	11000		100	U	100	U	100	U	100	U
F	SW6010	Chromium	ug/l	5 (	J	11		770		4.8 J		4.2 J		5 U		1.6	J
N	E300	Chloride	mg/l	31		60		250		45		51		6.5		63	
N	E300	Sulfate mg/l		130		1300		1700		380		390		62	62		
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	7.8		130		260		69		67		38		41	
N	SM2510B	LAB SPECIFIC CONDUC	CTANCI umhos/cm	390		2800		4000		1210		1240		360		640	

Notes:

N = normal

F = filtered

FS = field sample

FD = field duplicate

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

			Loc Name	GW	-26	GW-	34D	GW-	34D	GW-	34SR	GW-	-35S	GW-	42S	GW-	-76S
			Field Sample ID	OC-G	W-26	OC-GV	W-34D	OC-GW-	34D DUP	OC-GV	/-34SR	OC-GI	W-35S	OC-G	N-42S	OC-G	W-76S
			Field Sample Date	11/1	0/09	11/1	1/09	11/1	1/09	11/1	1/09	11/1	1/09	11/0	9/09	11/1	0/09
		QC Code		F	S	F	S	F	D	F	S	F	S	F	S	F	S
		Lab Sample Delivery Group		360-25	5552-1	360-25	5552-1	360-25	5552-1	360-25	5552-1	360-25	5552-1	360-25	5552-1	360-28	5552-1
Frac	Method	Analyte Units		Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum ug/l		100	U	100	U	100	U	100	U	100	U	260		100	U
F	SW6010	Chromium	ug/l	6.9		14		14		5 U		19		6.6		2	J
Ν	E300	Chloride	mg/l	18		15		15		1.2		7		44		3.1	
Ν	E300	Sulfate mg/l		68		29		29		8		190		6.4		35	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	28		16		15		0.24		23		0.21		8.3	
N	SM2510B	LAB SPECIFIC CONDUCT	TANCI umhos/cm	360		210		210		83		710		220		150	

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mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

			Loc Name	GW-	78S	GW-	79S	GW-0	CA1	PZ-1	6RR	PZ-1	7RR	PZ-	18R
			Field Sample ID	OC-GV	V-78S	OC-GV	V-79S	oc-gw	/-CA-1	OC-PZ	-16RR	OC-PZ	-17RR	OC-P	Z-18R
		F	ield Sample Date	11/1	1/09	11/10	0/09	11/11/09		11/1	0/09	11/1	0/09	11/1	0/09
		QC Code		FS	S	FS	S	FS	S	F:	S	F	S	FS	
		Lab Sample Delivery Group		360-25	552-1	360-25	552-1	360-25	552-1	360-25	5552-1	360-25	5552-1	360-25	5552-1
Frac	Method	Analyte	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	100	U	100	U	100 (	U	100	U	100	U	100	U
F	SW6010	Chromium	ug/l	2.1	J	8.9		3.3 .	J	6.5		3	J	13	
N	E300	Chloride	mg/l	22		210		6		190		18		79	
N	E300	Sulfate mg/l		540		1400		86		970		470	0 80		
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/I	61		190		1.1		230		58		26	
N	SM2510B	LAB SPECIFIC CONDUCT	ANC umhos/cm	1300		3400		600		3000		1400		570	

KJC 03/23/10

CSR 3/23/10

Prepared by / Date:

Checked by / Date:

Notes:

N = normal

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J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

			Loc Name	ISCO	01	ISCO	)2	ISCO3	PZ-16I	RR	PZ-17R	R	PZ-	18R	PZ-1	8R	SD-	17
		Fie	eld Sample ID	OC-SW-I	SCO1	OC-SW-I	SCO2	OC-SW-ISCO3	OC-SW-P	Z16RR	OC-SW-PZ	7RR	OC-SV	V-18R	OC-SW-1	8R-DUP	OC-SW	-SD17
		Field	Sample Date	11/12/	/09	11/12	/09	11/12/09	11/12/	/09	11/12/0	9	11/1:	2/09	11/12	2/09	11/12	2/09
			QC Code	FS		FS		FS	FS		FS		F	S	F	)	FS	ŝ
		Lab Sample Do	elivery Group	360-255	577-1	360-255	577-1	360-25577-1	360-255	77-1	360-2557	7-1	360-25	5577-1	360-25	577-1	360-25	577-1
Frac	Method	Analyte	Units	Result	Qual	Result	Qual	Result Qual	Result	Qual	Result (	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	73 J		110		100 U	93 J		70 J		75	J	84	J	70 .	J
F	SW6010	Chromium	ug/l	12		29		5 U	60		68		12		13		59	
F	SW6010	Sodium	ug/l	81000 J		150000 J		79000 J	170000 J		150000 J		82000	J	83000	J	140000	
N	E300	Chloride	mg/l	120		170		160	250		240		110		110		230	
N	E300	Nitrate as N	mg/l	0.05 U	J	1.4		0.97	3.9		4		0.05	U	0.05	U	4.3	
N	E300	Nitrite as N	mg/l	0.01 U	J	0.01 L	J	0.01 U	0.1 U	J	0.1 U		0.01	U	0.01	U	0.1	J
N	E300	Sulfate	mg/l	150		510		31	380		250		140		150		200	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	33 J		83 J		1.5 J	57 J		37 J		36	J	33	J	28 .	J
N	SM2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	790		1600		650	1600		1300		800		800		1300	
Т	SW6010	Aluminum	ug/l	280		350		55 J	4800		3400		290		280		2700	
Т	SW6010	Chromium	ug/l	34		68		5 U	1000		770		36		34		620	
Т	SW6010	Sodium	ug/l	71000 J		120000 J		60000 J	150000 J		130000 J		74000	J	71000	J	130000	

Notes:

N = normal

T = total (unfiltered)

F = filtered

FS = field sample

FD = field duplicate

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Prepared by / Date:

KJC 03/23/10

Checked by / Date:

CSR 3/23/10

			Loc Name	SD-SI	D1	SD-	SD1	SD-S	D2	SD-SI	)3	SD-S	SD4	SD-S	D5
			Field Sample ID	OC-SD-SD-SI	D1-0.0/0.5	C-SD-SD-SD	1-0.0/0.5 DU	OC-SD-SD-S	SD2-0.0/0.5	OC-SD-SD-SI	03-0.0/0.5	OC-SD-SD-S	SD4-0.0/0.5	OC-SD-SD-S	D5-0.0/0.5
			Field Sample Date	11/11/	09	11/1	1/09	11/11	/09	11/11/	09	11/11	1/09	11/11	/09
			QC Code	FS		F	D	FS	3	FS		FS	6	FS	3
		L	ab Sample Delivery Group	360-255	53-1	360-25	5553-1	360-25	553-1	360-255	53-1	360-25	553-1	360-25	553-1
Frac	Method	Analyte	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Т	SW6010	Aluminum	mg/kg	9200		11000		11000		9900		12000		13000	
T	SW6010	Chromium	mg/kg	21		22		77		20		25		320	
Т	SW6010	Iron	mg/kg	11000		18000		17000		14000		15000		18000	
N	E160.3	Percent Moisture	percent	44		42		35		36		41		33	
N	E160.3	Percent Solids	percent	56		58		65		64		59		67	

Notes:

N = normal

T = total (unfiltered)

FS = field sample

FD = field duplicate

mg/kg = milligram per kilogram

Prepared by / Date:

KJC 03/23/10

Checked by / Date:

### Table 3

### Validation Qualification Action Summary

### **Data Validation Report**

### November 2009 Slurry Wall / Cap Groundwater, Surface Water and Sediment

### Olin Chemical Superfund Site Wilmington, Massachusetts

SDG	Lab Sample ID	Analytical Method	Field Sample ID	Parameter	Lab Result	Lab Qualifier	Final Result	Final Qualifier	Val Reason Code	Units
360-25577-1	360-25577-1	LACH 107 06 1 B	OC-SW-ISCO3	Nitrogen, as Ammonia	1.5		1.5	J	MS-L	mg/l
360-25577-1	360-25577-1	SW6010	OC-SW-ISCO3	Sodium	79000		79000	J	TD	ug/l
360-25577-1	360-25577-1	SW6010	OC-SW-ISCO3	Sodium	60000		60000	J	TD	ug/l
360-25577-1	360-25577-2	LACH 107 06 1 B	OC-SW-ISCO2	Nitrogen, as Ammonia	83	1	83	J	MS-L	mg/l
360-25577-1	360-25577-2	SW6010	OC-SW-ISCO2	Sodium	150000		150000	J	TD	ug/l
360-25577-1	360-25577-2	SW6010	OC-SW-ISCO2	Sodium	120000		120000	J	TD	ug/l
360-25577-1	360-25577-3	LACH 107 06 1 B	OC-SW-PZ16RR	Nitrogen, as Ammonia	57		57	J	MS-L	mg/l
360-25577-1	360-25577-3	SW6010	OC-SW-PZ16RR	Sodium	150000		150000	J	TD	ug/l
360-25577-1	360-25577-3	SW6010	OC-SW-PZ16RR	Sodium	170000		170000	J	TD	ug/l
360-25577-1	360-25577-4	LACH 107 06 1 B	OC-SW-PZ17RR	Nitrogen, as Ammonia	37		37	J	MS-L	mg/l
360-25577-1	360-25577-4	SW6010	OC-SW-PZ17RR	Sodium	150000		150000	J	TD	mg/l
360-25577-1	360-25577-4	SW6010	OC-SW-PZ17RR	Sodium	130000		130000	J	TD	mg/l
360-25577-1	360-25577-5	LACH_107_06_1_B	OC-SW-SD17	Nitrogen, as Ammonia	28		28	J	MS-L	mg/l
360-25577-1	360-25577-6	LACH 107 06 1 B	OC-SW-18R	Nitrogen, as Ammonia	36		36	J	MS-L	mg/l
360-25577-1	360-25577-6	SW6010	OC-SW-18R	Sodium	74000		74000	J	TD	ug/l
360-25577-1	360-25577-6	SW6010	OC-SW-18R	Sodium	82000		82000	J	TD	ug/l
360-25577-1	360-25577-7	LACH 107 06 1 B	OC-SW-18R-DUP	Nitrogen, as Ammonia	33		33	J	MS-L	mg/l
360-25577-1	360-25577-7	SW6010	OC-SW-18R-DUP	Sodium	83000		83000	J	TD	ug/l
360-25577-1	360-25577-7	SW6010	OC-SW-18R-DUP	Sodium	71000		71000	J	TD	ug/l
360-25577-1	360-25577-8	LACH 107 06 1 B	OC-SW-ISCO1	Nitrogen, as Ammonia	33		33	J	MS-L	mg/l
360-25577-1	360-25577-8	SW6010	OC-SW-ISCO1	Sodium	81000		81000	J	TD	ug/l
360-25577-1	360-25577-8	SW6010	OC-SW-ISCO1	Sodium	71000		71000	J	TD	ug/l

J - Value is estimated

MS-L - MS and/or MSD recovery low

TD - Dissolved concentration exceeds total

mg/L - millgram per liter

ug/L - microgram per liter

Prepared by / Date: KJC 03/23/10

Checked by / Date: CSR 03/23/10

Version 1.2, Nov 2002

ACTION: If no, contact lab for submission of copy of completed COC.

### OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

Reviewer/Date	chn	Ricar	3/1	7/10
Sr. Review/Date			~ / /	
Lab Report # 2	5552			
Project # (a) O	71000	16		

	Al. CV		, ,
1.0	Laboratory Deliverable Requirements		2002
	1.1 Laboratory Information: Was all of the following provided in the laboratory report?  Check items received.		
	☐ Name of Laboratory ☐ Address ☐ Project ID ☐ Phone #  Client Information: ☐ Name ☐ Address ☐ Client Com	☐ Sample identification – Field a tact (IDs must be cross-refer	and Laboratory enced)
ACTIO	ON: If no, contact lab for submission of missing or illegible information.		
	1.2 Laboratory Report Certification Statement	Yes [ ] No [ ] N/A [ ]	Comments:
Does tl	he laboratory report include a completed Analytical Report Certification in the required	ormat?	
ACTIO	N: If no, contact lab for submission of missing certification or certification with correct		
	1.3 Laboratory Case Narrative:	Yes No NA NA	Comments:
	☐ Narrative serves as an exception report for the project and method QA/QC perform the		des an explanation of each discrepancy
		Certific	ation Statement.
ACTIO	N: If no, contact lab for submission of missing or illegible information.		
	1.4 Chain of Custody (COC) copy present with all documentation completed	Yes	Comments:
	NOTE: Olin receives and maintains the original COC.		

Yes [_	No []	N/A [_]	Comments:
)			
			ature requirement does not apply).
Yes 🏳	No [_]	N/A [_]	Comments:
s l Yes [_]	No [	N/A [_]	Comments:
Yes [_]	No [_]	N/A []	Comments:
Dilution Date of joints (soils mus	Factor preparation/ st be reporte		moisture or solids
Yes [_]	No [_]	N/A []	Comments:
	Yes [_]  Yes [_]  Yes [_]  Yes [_]	Yes   No    Yes   No    Yes   No    Yes   No    Dilution Factor Date of preparation.  Inits (soils must be reported)	d on the same day as collection, temper and lab IDs cross referenced  Yes   No NA NA STATES   No NA STATES    Yes   No NA NA STATES    Solution Factor   %  Date of preparation/extraction/diginits (soils must be reported in dry weight)

Metho	od blank resu	alts LCS recoverie	MS/MSD recoveries and RPDs	☐ Laboratory		37	applicable)	
ACTION	V: If no, cont	tact lab for submission of	of missing or incomplete information.	See 1	usd,	LCSD		
-0170000 10-0	Holding Ti					/	f	
17	y technical lexceeded? If water and so	Tolding time for metals	ned from date of collection to date of is 180 days from sample collection to an	analysis, been nalysis for both	Yes []	No []	N/A]	Comments:
NOTE: I	List samples	that exceed hold time w	ith # of days exceeded on checklist					
ACTION	N: If technic (UJ). If gros	cal holding times are ex ssly exceeded (2X holdi	sceeded, qualify all positive results (J) ang time) reject (R) all non-detect results.	and non-detects				
3.0	Laborator	y Method			/	(		
	3.1 Wa	as the correct laborate	ory method used?		Yes [ ]	No [_]	N/A [_]	Comments:
	So	ater Digestion il Digestion etals	3005A or 3010A or 3020A 3050B 6010B or 200.7					
compa	ared to the request var	requested method. C	y to provide justification for me ontact senior chemist to inform Cli	ent of change		/		
	3.2 Are	e the practical quanti	itation limits the same as those spe P	ecified by the	Yes 💹	No []	N/A [_]	Comments:
NOTE	: Verify that	the reported metals ma	tch the target list specified on the COC.					
CO10 1	2							

		f no, evaluate variation with respect to sample matrix, preparation, dilution, . If sample PQL is indeterminate, contact lab for explanation.	/			
3	.3	Are results present for each sample in the SDG?	Yes [/]	No [_]	N/A [_]	Comments:
ACTION:	: If no	, check Request for Analysis to verify if method was ordered and COC to verify that it				
3	.4	If dilutions were required, were dilution factors reported?	Yes []	No [_]	N/A [_]	Comments:
ACTION	: If no	, contact the lab for submission.				
4.0 <u>N</u>	<b>Aeth</b>	od Blanks	/			
4	.1	Is the Method Blank Summary present?	Yes [_]	No []	N/A [_]	Comments:
ACTIO	ON: I	If no, call the laboratory for submission of missing data.	1			
4	1.2	Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?	Yes []	No []	N/A [_]	Comments:
		If no, contact laboratory for justification. Consult senior chemist for action rate non-compliance.	,			
4	1.3	Is the method blank less than the PQLs for all target elements?	Van I	No.f 1	N/A [ ]	Comments:
NOTE: sample		DEP requires the method blank to be matrix matched and digested with the	ies 🖊	NO	/	Comments:
		Do any method blanks have positive results for metals? Qualify data according to owing:	Yes [_]	No [	N/A [_]	Comments:

If the sample concentration is $< 5 \times \text{blank value}$ , flag sample result non-detect "U" at the	he
PQL or the concentration reported if greater than the PQL.	

If the sample concentration is  $> 5 \times$  blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = 5x the blank value) and the associated samples and qualifiers.

5.1 Was a laboratory control standard run with each analytical batch of 20 samples or less?  NOTE: A full target, second source LCS is required by MADEP.  ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.  5.2 Is a LCS Summary Form present?  ACTION: If no, contact lab for resubmission of missing data.  5.3 Is the recovery of any analyte outside of MADEP control limits?  MADEP  Yes [ ] No [ ] N/A [ ]	Comments:
ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.  5.2 Is a LCS Summary Form present?  ACTION: If no, contact lab for resubmission of missing data.  5.3 Is the recovery of any analyte outside of MADEP control limits?  Yes [ ] No [ ] N/A [ ]	
ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.  5.2 Is a LCS Summary Form present?  ACTION: If no, contact lab for resubmission of missing data.  5.3 Is the recovery of any analyte outside of MADEP control limits?  Yes [ ] No [ ] N/A [ ]	
5.2 Is a LCS Summary Form present?  ACTION: If no, contact lab for resubmission of missing data.  5.3 Is the recovery of any analyte outside of MADEP control limits?  Yes [ ] No [ ] N/A [ ]	
ACTION: If no, contact lab for resubmission of missing data.  5.3 Is the recovery of any analyte outside of MADEP control limits?  Yes [ ] No [ ] N/A [ ]	
ACTION: If no, contact lab for resubmission of missing data.  5.3 Is the recovery of any analyte outside of MADEP control limits?  Yes [ ] No [ ] N/A [ ]	
5.3 Is the recovery of any analyte outside of MADEP control limits?  MADEP  Yes No N/A	
	Comments:
Sample Type % Rec	
Water 80-120	
Soil within Lab generated limits	
ACTION: If recovery is above the upper limit, qualify all positive sample results	
within the batch as (J). If recovery is below the lower limit, qualify all positive and non-detects results within the batch as (J). If LCS recovery is <30%, positive and non-	
detect results are rejected (R).	
detect results are rejected (15).	

Comments:

### 6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

Were project-specific MS/MSDs collected? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present?

NOTE: A full target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.3 Were matrix spikes analyzed as indicated on the COC and project schedule?

**ACTION**: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

6.4 Are any metal spike recoveries outside of the QC limits?

	MADEP	QAPP	
Sample Type	% Rec	% Rec	Method
Water	75-125	N/A	6010B
Water	N/A	70-130	200.7
Soil	75-125	75-125	6010B

NOTE: 
$$%R = (SSR-SR) \times 100\%$$
  
SA

Where: SSR = Spiked sample result

SR = Sample result

SA = Spike added

**NOTE:** If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags. ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J). Are any RPDs for MS/MSD recoveries outside of the QC limits? 6.5 Where: S = MS sample result NOTE: RPD = S-D x 100% D = MSD sample result (S+D)/2NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied. ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J). Laboratory Duplicate 7.0 7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Yes [ ] No [ ] N/A [ Duplicate Sample Form present? NOTE: MADEP refers to this sample as a "matrix duplicate". ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance. 7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits?

MADEP Laboratory Duplicate Sample RPD Criteria:	QAPP RPD
For aqueous results > $5 \times RL$ , RPD must be $\pm 20\%$	20
For aqueous results < 5× RL, RPD must be ≤ RL	20
For soil/sediment results > $5 \times RL$ , RPD must be $\pm 35\%$	20
For soil/sediment results $< 5 \times RL$ , RPD must be $\leq 2 \times RL$	20
ACTION: If the RPD exceeds the limits, qualify both posit as estimated and flag them J. Narrate non-compliance	ive results and non-detects
	0. 6

### 8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

- 8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.
- 8.2 Do any rinsate blanks have positive results?

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is  $< 5 \times$  blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is  $> 5 \times$  blank value, no qualification is needed.

### 9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.



9.2 Were field duplicates collected per the required frequency?	Yes 🔼	No 📋	N/A [_]	Comments:
SOW ☐ QAPP (1 per 10) 🗘 MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐		t		
9.3 Was the RPD ≤ 50% for soils or waters? Calculate the RPD for all results and attach to this review.	Yes [_	No [_]	N/A [_]	Comments:
CTION: RPD must be ≤50% for soil and water. Qualify data (J) for both sample results it	f the RPD e	exceeds 50	%.	
0.0 Special QA/QC			7	
10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal.	Yes []	No [_]	N/A []	Comments:
ACTION: If results for both total and dissolved are $\geq 5x$ the PQL and the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than $5x$ the PQL and the difference exceeds $2x$ the PQL flag both results as estimated (I)				10 20

10.0	Application of Validation Qualifiers		/	
	Was any of the data qualified?	Yes []	No N/A	Comments:
If so, ap	oply data qualifiers directly to the DQE copy of laboratory report and fla	ag pages for entry in database.		

### REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (OA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

analysis_method	lab_sample_id	field_sample_id	param_name	final_resu	llt	lab_resul	t_text	Dup		result_uom
SW6010	360-25552-10	OC-GW-202S	Aluminum	100	U	100	U	100	U	ug/l
E300	360-25552-10	OC-GW-202S	Chloride	45		45		51		mg/l
SW6010	360-25552-10	OC-GW-202S	Chromium	4.8	J	4.8	J	4.2	J	ug/l
SM2510B	360-25552-10	OC-GW-202S	LAB SPECIFIC CONDUCTA	N 1200		1200		1200		umhos/cm
LACH_107_06_1_B	360-25552-10	OC-GW-202S	Nitrogen, as Ammonia	69		69		67		mg/l
E300	360-25552-10	OC-GW-202S	Sulfate	380		380		390		mg/l
SW6010	360-25552-20	OC-GW-202S DUP	Aluminum	100	U	100	U			ug/l
E300	360-25552-20	OC-GW-202S DUP	Chloride	51		51				mg/l
SW6010	360-25552-20	OC-GW-202S DUP	Chromium	4.2	J	4.2	J			ug/l
SM2510B	360-25552-20	OC-GW-202S DUP	LAB SPECIFIC CONDUCTA	N 1200		1200				umhos/cm
LACH_107_06_1_B	360-25552-20	OC-GW-202S DUP	Nitrogen, as Ammonia	67		67				mg/l
E300	360-25552-20	OC-GW-202S DUP	Sulfate	390		390				mg/l
SW6010	360-25552-15	OC-GW-34D	Aluminum	100	U	100	U	100	U	ug/l
E300	360-25552-15	OC-GW-34D	Chloride	15		15		15		mg/l
SW6010	360-25552-15	OC-GW-34D	Chromium	14		14		14		ug/l
SM2510B	360-25552-15	OC-GW-34D	LAB SPECIFIC CONDUCTA	N 210		210		210		umhos/cm
LACH_107_06_1_B	360-25552-15	OC-GW-34D	Nitrogen, as Ammonia	16		16		15		mg/l
E300	360-25552-15	OC-GW-34D	Sulfate	29		29		29		mg/l
SW6010	360-25552-19	OC-GW-34D DUP	Aluminum	100	U	100	U			ug/l
E300	360-25552-19	OC-GW-34D DUP	Chloride	15		15				mg/l
SW6010	360-25552-19	OC-GW-34D DUP	Chromium	14		14				ug/l
SM2510B	360-25552-19	OC-GW-34D DUP	LAB SPECIFIC CONDUCTA	N 210		210				umhos/cm
LACH_107_06_1_B	360-25552-19	OC-GW-34D DUP	Nitrogen, as Ammonia	15		15				mg/l
E300	360-25552-19	OC-GW-34D DUP	Sulfate	29		29				mg/l

Dups All De.

Version 3, October 2008

### **OLIN-WILMINGTON** LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Reviewer/Date	Chrs Recards	3/17/10
Sr. Review/Date		
Lab Report #	25552	
Project # 61	07/00016	

Anions, NH3

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory. Laboratory Deliverable Requirements 1.0 1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes [ / Check items received. Sample identification - Field and Laboratory Name of Laboratory (IDs must be cross-referenced) Client Information: ACTION: If no, contact lab for submission of missing or illegible information. 1.2 Laboratory Report Certification Statement Comments: Does the laboratory report include a completed Analytical Report Certification in the required format? ACTION: If no, contact lab for submission of missing certification or certification with correct format. Comments: 1.3 Laboratory Case Narrative: Narrative serves as an exception report for the project and method QA/QC performance. ☑ Narrative includes an explanation of each discrepancy on the Certification Statement. Sample Dilution For Anions 300.0 ACTION: If no, contact lab for submission of missing or illegible information. 1.4 Chain of Custody (COC) copy present with all documentation completed? Comments: Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG? **NOTE:** Olin receives and maintains the *original* COC. **ACTION**: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

		Yes [_]	No [_]	N/A []	Comments:
Sample temperature	confirmed: must be 1° - 10° C. (If samples were sent by courier and delivered o	n the same o	lay as collect	ion, temperatu	re requirement does not apply).
Container type noted	Condition observed pH verified (where applicable) Field and lab II	Os cross refe	renced		
1.5.1	were the correct bottles and preservatives used?  1 Liter polyethylene/H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C	Yes 🗾	No [_]	N/A [_]	Comments:
	e – 1 Liter glass/HCL or H2SO4 to pH<2,cool to 4°C  1 Liter polyethylene/cool to 4°C				
Chemical Or Chloride, pH	kygen Demand – 50 mL polyethylene/H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C I, sulfate, nitrate, nitrite - 50 mL polyethylene/cool to 4°C				
	e - H2SO4 to pH<2,cool to 4°C bon – 500 mL amber glass bottle/HCl or H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C				*
Sulfide – 50	mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C				
	H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C aductance, TDS, TSS – 100 mL polyethylene/cool to 4°C				
container/volume (if	inform senior chemist. Document justification for change in applicable), qualify positive and non-detect data (J) data if cooler 10°C. Rejection of data requires professional judgment		•		
1.5.2	Were all samples delivered to the laboratory without breakage?	Yes [_	No [_]	N/A [_]	Comments:
1.5.3	Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?	Yes []	No [	N/A []	Comments:

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### OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST

### WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

1.6 Sample Result		following information supplied in the	laboratory Yes []	No []	N/A [_]	Comments:	
Field ID and Lab ID	Date and time of Analysis method	ollected Analyst Initials	Dilution Date of preparation			oisture or solids m-up and analysis, w	Reporting limi
Matrix	☐ Target analytes and		Units (soils must	be reported	in dry weight)		
ACTION: If no, contact lab	for submission of miss	ing or incomplete information.					
for each sample bate  Method blank results	h?	ing information provided in the laborated MS/MSD recoveries and RPDs	/		N/A []	Comments:	
2.0 <u>Holding Times</u>		*	Yes []	No 🗾	N/A]	Comments:	Sf
Have any technical	holding times, determi	ned from date of collection to date of in demand, chloride, organic carbon, o	analysis, been exceede	d? The hold	ling times are	as follows:	
S			pH = analyze imme			nitrogen as N = 48	hre
Alkalinity = 1	1.52	Sulfide, TDS, TSS = 7 days	pri – anaryze mime	diately	Muate	muogen as IV – 40	m s
S	n as $N = 48 \text{ hrs}$	Nitrate + Nitrite as $N = 28$ days					
Description 1997 1997 1997 1997 1997 1997 1997 199		with # of days exceeded on checklist					
ACTION: If technical hold judgment used to qualify soils		d qualify results (J). For water sample		Ž.			t results. Professional
3.0 Laboratory	Method		Yes 🗾	No []	N/A [_]	Comments:	
3.1 Was the correct l	aboratory method used	1?			2		
ACTION: If no, contact lab to	o provide justification	for method change compared to the req	uested method. Contact	senior chem	ist to inform C	Client of change or to	request variance.

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	3.2 Are the practical quantitation lin ☐ QAPP/IRSWP ☐ Lab?	mits the same as those specified b	by the record	Comments:
	Note: The MADEP QA/QC Guidelines do therefore all criteria will default to values stip define criteria, QA/QC requirements default may also apply.	ulated in the QAPP*. Where the QAPP do	alyses, bes not All Detected criteria	in samples.
	Ammonia* $\Box = 0.1 \text{ mg/ L}$	Alkalinity** $\square = 1 \text{ mg/L}$	Bicarbonate Alkalinity** $\square = 1 \text{ mg/L}$	Carbonate Alkalinity** $\square = 1 \text{ mg/L}$
	Nitrate Nitrogen as N* □ = .05 mg/L	Nitrite Nitrogen as N* $\square$ = .01 mg/L	Chloride* $\square = 1 \text{ mg/L}$	Hardness $*\Box = 2 \text{ mg/L}$
	Spec. Cond.** □ 3 umhos/cm	Total Organic Carbon** □ = 1 mg/L	Oil & Grease* $\square = 5.5 \text{ mg/L}$	Sulfate (EPA 300.0)* $\square = 2 \text{ mg/L}$
	COD:* Low – 20 mg/L	COD* High - 50 mg/L □	$TDS* \square = 10 \text{ mg/L}$	TSS* $\square$ = 5 mg/L
	pH* □ < 2 to > 12	Phenolic - 0.01 mg/L		
	Other parameter(list)	_PQL = 🗆 :	Source of PQL =	
	Other parameter(list)	_ PQL =	Source of PQL =	
ACTIO			e, etc. If sample PQL is indeterminate, contact lab	
	3.3 Are the appropriate parameter results pro	esent for each sample in the SDG?	Yes	Comments:
ACTIO	N: If no, check Request for Analysis to verify	y if method was ordered and COC to verif	y that it was sent, and contact lab for resubmissio	n of the missing data
	3.4 If dilutions were required, were dilution to	factors reported?	Yes No No N/A	Comments:
ACTIO	N: If no, contact the lab for submission.		/	
4.0	Method Blanks		Yes No No N/A	Comments:
ACTIO	4.1 Are the Method Blank Summaries present.  N: If no, call the laboratory for submission o		*	
	4.2 Was a method blank analyzed for each 20 or less?	analysis batch of wet chemistry field sam	oles of Yes No No N/A	Comments:

ACTIO	N: If no,	document discrepancy in case narrative and contact lab for justification. Consult seni	or chemist fo	or action need	ded.	
	4.3 Is the	e method blank less than the PQL? (See Section 3.2 for PQLs).	Yes 📗	No [_]	N/A []	Comments:
				/		
		any method blanks have positive results for wet chemistry parameters? Qualify data ag to the following:	Yes [_]	No [	N/A [_]	Comments:
	If the sar PQL or	mple concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the the concentration reported if greater than the PQL.				
	If the san	mple concentration is $> 5 \times$ blank value, no qualification is needed.				
ACTIO		y blank has positive results, list all the concentrations detected and flagging level (fla	gging level =	= 5 × blank v	value) on the c	hecklist. List all affected samples and thei
5.0	Labora	tory Control Standards	1			
	5.1	Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?	Yes []	No [_]	N/A [_]	Comments:
ACTIC judgme	N: If no nt to deter	, call laboratory for LCS form submittal. If data is not available, use professional mine qualification actions for data associated with the batch.	,			
	5.2	Is a LCS Summary Form present?	Yes [_]	No [_]	N/A [_]	Comments:
ACTIC	N: If no,	contact lab for resubmission of missing data.		/		
	5.3	Is any wet chemistry analyte LCS recovery outside the control limits?	Yes []	No [	N/A [_]	Comments:

WET CHEM.doc

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33	LCS Limits:		*				7
	Alkalinity** $\square$ = 80-120% Total Organic Carbon** $\square$ = 80-120% COD Low* $\square$ = 80-120% Hardness* $\square$ = 80-120%	Bicarbonate Alkalinity** $\Box$ = 80-120% TDS** $\Box$ = 80-120% COD High* $\Box$ = 80-120% Chloride* $\Box$ = 80-120%	Carbonate Alkalinit Oil & Grease* □ = Nitrate Nitrogen Sulfate (EPA 300.0	= 80-120% as N**□ =	= 80-120%	Specific Conductivity Ammonia Nitrogen a Nitrite Nitrogen as pH* □ = 98-102%	s N* = 80-120%
	Other parameter(list)	%R =		☐ Rec Li	mits=	4	
	Other parameter(list)	%R =					n e
		(MADEP has not yet defined LCS recov				28	
ACTIC within t	ON: If recovery is above the upper limit, he batch as (J). If LCS recovery is <10%	qualify all positive sample results within the b, non-detect results are rejected (R).	batch as (J). If recov	ery is belov	the lower lin	mit, qualify all positive	and no-detect results
6.0	Matrix Spikes			70			
Matrix	spikes may be collected at different c schedules. Confirm spike requirem	frequencies based on monthly, quarterly, ents for each set with the senior chemist.	or task				
-		Os analyzed? List project samples that were sp	.:td /	No 🔲	N/A []	Comments:	
	6.2 Is the MS/MSD Recovery For ON: If no, contact lab for resubmission of	rm present?	Yes []	No [_]	N/A [_]	Comments:	
110110		at the required frequency of 1 per 20 sam	ples per Yes [_]	No []	N/A []	Comments:	
ACTIO	N: If any matrix spike data is missing, c	all lab for resubmission.	1 - Magazini (1				
	6.4 Are any wet chemistry analyte	e spike recoveries outside of the QC limits?	Yes [	No []	N/A [_]	Comments:	
			NH3 out	high	in 00	C-6W-Z0Z	S - 1.0.1.
WET C	HEM.doc		pa	יכן 12 ige 5	ut San	C-6W-Z0Z	evaluation

	NOTE:	%R = (S:	SR-SR) x	100%		Where	e: S	SR =	Spiked sam	
		SA		SA = Spike added						•
				σ.						
	MS/MSD Recovery Limi	its:		College Sections also Sections	ran I no automores.				, F 75 1250	
	Alkalinity* = $NA$	1		Alkalinity* = $NA$	Carbonate alkalinity*			8	$\Box = 75-125\%$	
	Alkalinity* = NA Chloride*(SM 4500 Cl)	<b>1</b> = 75-125%	Specific Con	ductivity * = NA	Total Organic Carbon		TDS** =		720 <u>181</u> 2 - Serias - Massachina	
	Oil & Grease* = NA			□ = 75 <b>-</b> 125%	COD High* $\square = 75$ -			E	** □ = 75-125%	
	Nitrite Nitrogen as N** □	I = 75-125%	Hardness*	] = 75-125%	Sulfate (EPA 300.0)*					
	Other parameter(list)			% R =		Rec Lim	nits =			
	* = Laboratory Limits				ot yet defined LCS reco					
	NOTES: 1) If only one of 2) If the MS/MS	f the recoveries f SD was performe	for an MS/MSD d by the laborate	pair is outside of the co	ontrol limits, no qualifica mple, no qualification is 1	tion is necessary required.	. Use profe	ssional judg	ment for the MS/	MSD flags.
ualify <sub>I</sub> 1S/MS	ON: MS/MSD flags only appositive results as estimated D recovery is < 30% and the	d (J). If the recone sample is non-	veries of the MS detect, the result	S and MSD are lower to s are considered unusal	han the lower control ling ble and flagged (R).	nit but > 30%, o	quality both	positive res	ults and non-dete	ects (J). If the
	N: Laboratory control limed, but no flags are applied.	its apply when s	piked sample re	sults fall within the no	rmal calibration range. If	dilutions are re	equirea aue	to nign sam	pie concentration	is, the data is
vaiuate	6.5 Are any RPDs for MS	MSD recoveries	outside of the	DA/OC limits?		/				
	NOTE: RPD = $\frac{S - D}{(S + D)/2}$	_ x 100% WI		ılt	Yes []	No L	V/A []	Comments		
	(S+D)/2		D - MSD I	esuit						
	MS/MSD RPD Limits:									
	RPD ≤20									
.0	Laboratory Duplicate									
	Are the RPDs for the labor	oratory duplicate	es <20% unless	otherwise specified be	low? Yes []	No [_] N	√A []	Comments	:	

page 6

ACTIO	ON: If the RPD is greater than speci	ified limits, qualify all results fo		ts:				
	pH* □ = 3% Sp	ecific Conductivity *□ = 5%	TSS** $\square = 6\%$		5	ΓDS** □ = 6%	ó	
8.0	Sampling Accuracy							
	najority of ground water samples edicated tubing. Rinse blanks w		a tap, process stream, or		~			
	8.1 Were rinsate blanks collected associated samples from the senio	d? Prior to evaluating rinsate or chemist.	blanks, obtain a list of the	Yes []	No [_]	N/A [_]	Comments:	
	8.2 Do any rinsate blanks have po	ositive results?		Yes []	No [_]	N/A [_]	Comments:	
ACTI	ON: Evaluate rinsate results vs.  If the sample concentration is < 5  If the sample concentration is > 5	5 × blank value, flag sample rest	ult non-detect "U" at the PQL					g to the table below.
NOTE	: MADEP does not require the c	collection of rinsate blanks.						
9.0	Field Duplicates  9.1 Were field duplicate samp field duplicates.	oles collected? Obtain a list of s	samples and their associated	Yes [	No [_]	N/A [_]	Comments:	
	9.2 Were field duplicates collected the MADEP Option	ed per the required frequency?	- 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4	Yes [_]	No [_]	N/A [_]	Comments:	
Q.	APP/IRSWP □ MADEP Option  9.3 Was the RPD ≤ 30% for water attach to this review.			Yes [_]	No [_]	N/A []	Comments:	

ACTION: Qualify data (J) for both sample results if the RPD exceeded.					
		/	/		
Was any of the data qualified?	Yes []	No 🗹	N/A []	Comments:	
If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.					

### REFERENCES:-

MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts.; Project No. 6300-06-0010/41.1; July 25, 2007.

Massachusetts Department of Environmental Protection (MADEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.





### ANALYTICAL REPORT

Job Number: 360-25552-1

Job Description: Olin Chemical Groundwater Quarterly

For:

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Attention: Mr. Steven Morrow

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY:

Approved for release.
Joe Chimi
Report Production Representative
11/25/2009 10:43 AM

Designee for
Becky C Mason
Project Manager II
becky.mason@testamericainc.com
11/25/2009

Joseph a. Cheur J.

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY ELAP 10843, North Carolina 647, NELAP PA 68-04386. Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002.



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Laboratory Name:		e: TestAmerica Westfield			Pro	360-25552-1			
Project Lo	ocation:				MADEP	RTN <sup>1</sup> :			
		cations for the fo	ollowing data set:	list Laborator	ry Sample ID Nu	mber(s)]			
360-25552	2-(1-20)								
Sample M	latrices:	Groundwater	Soil/Se	 diment	Drinking Wate	er Oth	er:		
MCP SW		8260B( )	8151A ( )	8330 ( )	6010B (x)	7470A/1A	( )	Othe	r ( )
Methods	s Used	8270C( )	8081A ( )	VPH()	6020 ()	9014M <sup>2</sup> /9	012()		
As specifi	ed in MADEP	8082 ( )	8021B ( )	EPH()	7000 S³( )	7196A (	)		
Compend			Tracking Numb	, ,					
•	Methods.		Method 9014 or					Metho	d
check all	that apply)	3 S - SW-846	Methods 7000 S	eries List ind	lividual method a	ind analyte	•		
An aff	firmative respo	nse to questio	ns A, B, C and [	) is required	for "Presumpti	ve Certain	ty" statı	IS	
Α	Were all sam	ples received by	the laboratory in	a condition c	onsistent with		Yes		No <sup>1</sup>
	that described on the Chain-of-Custody documentation for the data set?								
	Were all QA/0	QC procedures r	equired for the s	pecified analy	tical method(s)		Yes		No <sup>1</sup>
В		•	d, including the re		, ,		$\checkmark$		
	discuss in a n								
	standards or g	guidelines?							
	Does the anal	vtical data inclu	ded in this report	meet all the r	requirements		Yes	N/A	No <sup>1</sup>
С		-	s described in Se		•	of	√	,, .	. 10
	the MADEP document CAM VII A, " Quality Assurance and Quality								
			quisition and Rep		•				
	VPH and EPH	d methods only	v: Was the VPH o	or EDH Metho	nd conducted with	oout	Yes	N/A	No <sup>1</sup>
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?						163	√ √	140
	olgriilloant mo	amoutions (see	000001111.0011	copcolive ivio	111003):			'	
	A respon	se to questions	s E and F below	is required f	or "Presumptiv	e Certaint	y" statu:	S	
E	Were all QC p	performance sta	ndards and reco	mmendations	for the		Yes		No <sup>1</sup>
	specified met	hods achieved?					$\sqrt{}$		
F	Were results for all analyte-list compounds/elements for the specified						Yes	N/A	No <sup>1</sup>
	method(s) reported?								
	<sup>1</sup> All Negative	responses must	be addressed in	an attached	Environmental L	aboratory o	ase narr	ative.	
, the und			ins and penaltie						
nquiry of	f those respon	sible for obtain	ning the informa	tion, the mat	terial contained	in this			
	l report is, to tl	ne best of my k	nowledge and b	elief, accura	ate and complet	e.			
analytica		1.	~/-/				_		
analytica	<b>~</b> !	ST	Fartus		Position	: Laborato	ory Dire	ctor	
analytica	Signature:				Date	:	11/25/09	9 10:37	
	_	Steven C. Ha	artmann		Date		11/20/03		
	Printed Name	Steven C. Ha	artmann				11/20/03		pril-04
	Printed Name	ally signed and approved.			CAM VI	I A, Rev 3.2	11/20/00		pril-04
The certification	Printed Name:		NELAP FL E87912 TOX NELAP NJ MA008 TOX			I A, Rev 3.2	11/20/00		pril-04
The certification	Printed Name:	ally signed and approved.  MADEP MA014	NELAP FL E87912 TOX	60 M ACCOMO.	CAM VI	I A, Rev 3.2	11/20/00		pril-04

Laboratory Name:		e: TestAmerica Westfield			Proj	360	-25552	? <b>-1</b>	
Project Lo	cation:				MADEP	RTN <sup>1</sup> :			
		cations for the f	ollowing data set	:[list Laborator	y Sample ID Nur	mber(s)]			
360-25552	2-(1-20)								
Sample M	latrices:	Groundwate	r Soil/Se	diment	Drinking Wate	r Othe	er:		
MCP SW	<b>/-846</b>	8260B( )	8151A ( )	8330 ( )	6010B ( )	7470A/1A	( )	Other	. ( <b>x</b> )
Methods	Used	8270C( )	8081A ( )	VPH()	6020 ( )	9014M <sup>2</sup> /9	` '		
	ed in MADEP	8082 ( )	8021B ( )	EPH()	7000 S <sup>3</sup> ( )	7196A (	)		
Compend			e Tracking Numb	, ,			I- (DAG	>>	
•	Methods. that apply)		6 Method 9014 of 6 Methods 7000 S	-		-	•	) ivietno	a
	,								
			ons A, B, C and			re Certaini	Yes		<b>.</b> . 1
Α	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?								No <sup>1</sup>
		•	required for the s	•	, ,		Yes		No <sup>1</sup>
В		•	ed, including the r	-			√		
			a that did not me	et appropriate	performance				
	standards or g	guidelines?							
	Does the analytical data included in this report meet all the requirements							N/A	No <sup>1</sup>
С	for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of							$\sqrt{}$	
	the MADEP document CAM VII A, " Quality Assurance and Quality  Control Guidelines for the Acquisition and Reporting of Analytical Data"?								
	Control Guide	lines for the Ac	quisition and Rep	porting of Anal	ytical Data"?				
	VPH and EPH	VPH and EPH methods only: Was the VPH or EPH Method conducted without						N/A	No <sup>1</sup>
D	significant modifications (see Section 11.3 of respective Methods)?							$\sqrt{}$	
	A =====	44i	. F and F balan		"D	- Cantaint	داا مدمد		
			s E and F below			e Certainty			<b>.</b> . 1
E	Were all QC performance standards and recommendations for the						Yes		No <sup>1</sup>
	specified methods achieved?							<b>N</b> 1/A	√ 1
F	Were results for all analyte-list compounds/elements for the specified							N/A	No <sup>1</sup>
	method(s) rep	опеа?						V	
	<sup>1</sup> All Mogative r	ocnoncoc mus	t be addressed in	an attached	Environmental L	aborotory o	000 no	rrativo	
460								iralive.	
	_	-	ains and penaltion ing the information in the infor				onai		
	-		knowledge and						
		200 20 20 20 20 20 20 20 20 20 20 20 20	200000000000000000000000000000000000000	,					
	Signature:	St	Harting		Position	Laborato	ory Dire	ector	
	Printed Name:	Steven C. H	artmann		Date:	:	11/25/0	09 10:37	
he certification	form has been electronica	ally signed and approved			CAM VII	A, Rev 3.2		А	pril-04
		MADEP MA014	NELAP FL E87912 TOX		TestAmerica Westfield	i			
Test <sub>A</sub>	merica	NY DOH 10843	NELAP NJ MA008 TOX		53 Southampton Rd,				
	ENVIRONMENTAL TESTING	RI DOH 57 CT DPH 0494	NELAP NY 10843 NH DES 253901-A	SILEO IN ACCORDANCE	Westfield, MA 01085 Tel:(413)572-4000				

### **CASE NARRATIVE**

**Client: Olin Corporation** 

**Project: Olin Chemical Groundwater Quarterly** 

Report Number: 360-25552-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes or interferences which exceed the calibration range of the instrument.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

### **RECEIPT**

The samples were received on 11/11/2009; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 5.6 C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

MCP regulatory standard criteria were not specified for this report. Therefore, method reporting limits (RLs) were not assessed against any MCP standards as it may pertain to Question "E" on the Presumptive Certainty Certification Form (MADEP reference: WSC-CAM-AN-093008 - WSC-CAM Analytical Notes).

### **DISSOLVED METALS**

Samples 360-25552-1 through 360-25552-20 were analyzed for dissolved metals in accordance with EPA SW-846 Method 6010B. The samples were analyzed on 11/13/2009 and 11/16/2009.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No difficulties were encountered during the dissolved metals analyses.

All quality control parameters were within the acceptance limits.

### **ANIONS**

Samples 360-25552-1 through 360-25552-20 were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 11/16/2009, 11/17/2009, 11/18/2009 and 11/19/2009.

Samples 360-25552-2(10X), 360-25552-2(20X), 360-25552-3(5X), 360-25552-7(5X), 360-25552-8(10X), 360-25552-8(20X), 360-25552-9 through 360-25552-12(10X), 360-25552-13(5X), 360-25552-17(5X), 360-25552-18(10X), 360-25552-18(20X) and 360-25552-20(5X) required dilution prior to analysis due to high target concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the anions analyses.

All quality control parameters were within the acceptance limits.

### **AMMONIA**

Samples 360-25552-1 through 360-25552-20 were analyzed for ammonia in accordance with LACHAT 107-06-1B. The samples were prepared and analyzed on 11/18/2009 and 11/24/2009.

Ammonia failed the recovery criteria high for the MS and MSD of sample 360-25552-10 in batch 360-51839. The presence of the '4' qualifier in the report indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. The associated LCS recovered within control limits. Refer to the QC report for details.

Samples 360-25552-2(10X), 360-25552-4(5X), 360-25552-6(5X), 360-25552-7(10X), 360-25552-8(20X), 360-25552-9(10X), 360-25552-10(10X), 360-25552-11(20X), 360-25552-12(10X), 360-25552-13(2X), 360-25552-17(2X), 360-25552-18(20X) and 360-25552-20(10X) required dilution prior to analysis due to high concentration. The reporting limits have been adjusted accordingly.

No other difficulties were encountered during the ammonia analyses.

All other quality control parameters were within the acceptance limits.

### SPECIFIC CONDUCTANCE

Samples 360-25552-1 through 360-25552-20 were analyzed for specific conductance in accordance with SM 2510B. The samples were analyzed on 11/12/2009 and 11/13/2009.

No difficulties were encountered during the specific conductance analyses.

All quality control parameters were within the acceptance limits.

Lab Sample ID Cl Analyte	lient Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-25552-1	OC-GW-42S				
Sulfate		6.4	2.0	mg/L	300.0
Chloride		44	1.0	mg/L	300.0
Ammonia		0.21	0.10	mg/L	L107-06-1B
Specific Conductance		220	1.0	umhos/cm	SM 2510B
Dissolved					
Aluminum		260	100	ug/L	6010B
Chromium		6.6	5.0	ug/L	6010B
360-25552-2	OC-GW-201S				
Sulfate		1300	40	mg/L	300.0
Chloride		60	10	mg/L	300.0
Ammonia		130	1.0	mg/L	L107-06-1B
Specific Conductance		2800	1.0	umhos/cm	SM 2510B
Dissolved					
Chromium		11	5.0	ug/L	6010B
360-25552-3	OC-GW-10S				
Sulfate	00 011 100	130	10	mg/L	300.0
Chloride		31	5.0	mg/L	300.0
Ammonia		7.8	0.10	mg/L	L107-06-1B
Specific Conductance		390	1.0	umhos/cm	SM 2510B
Dissolved					
Aluminum		4300	100	ug/L	6010B
360-25552-4	OC-GW-26				
	OC-GVV-20			_	
Sulfate		68	2.0	mg/L	300.0
Chloride		18	1.0	mg/L	300.0
Ammonia		28	0.50	mg/L	L107-06-1B
Specific Conductance		360	1.0	umhos/cm	SM 2510B
Dissolved					
Chromium		6.9	5.0	ug/L	6010B

Lab Sample ID CI Analyte	ient Sample ID	Result / C	tualifier	Reporting Limit	Units	Method
360-25552-5	OC-GW-76S					
Sulfate		35		2.0	mg/L	300.0
Chloride		3.1		1.0	mg/L	300.0
Ammonia		8.3		0.10	mg/L	L107-06-1B
Specific Conductance		150		1.0	umhos/cm	SM 2510B
Dissolved						
Chromium		2.0	J	5.0	ug/L	6010B
360-25552-6	OC-GW-24					
Sulfate		62		2.0	mg/L	300.0
Chloride		6.5		1.0	mg/L	300.0
Ammonia		38		0.50	mg/L	L107-06-1B
Specific Conductance		360		1.0	umhos/cm	SM 2510B
360-25552-7	OC-GW-25					
Sulfate		100		10	mg/L	300.0
Chloride		63		5.0	mg/L	300.0
Ammonia		41		1.0	mg/L	L107-06-1B
Specific Conductance		640		1.0	umhos/cm	SM 2510B
Dissolved						
Chromium		1.6	J	5.0	ug/L	6010B
360-25552-8	OC-GW-79S					
Sulfate		1400		40	mg/L	300.0
Chloride		210		10	mg/L	300.0
Ammonia		190		2.0	mg/L	L107-06-1B
Specific Conductance		3400		1.0	umhos/cm	SM 2510B
<b>Dissolved</b> Chromium		8.9		5.0	ug/l	6010B
Omonium		5.5		5.0	ug/L	00100
360-25552-9	OC-GW-78S					
Sulfate		540		20	mg/L	300.0
Chloride		22		1.0	mg/L	300.0
Ammonia		61		1.0	mg/L	L107-06-1B
Specific Conductance		1300		1.0	umhos/cm	SM 2510B
Dissolved						
Chromium		2.1	J	5.0	ug/L	6010B

Lab Sample ID Cl Analyte	ient Sample ID	Result / Q	ualifier	Reporting Limit	Units	Method
360-25552-10	OC-GW-202S					
Sulfate		380		20	mg/L	300.0
Chloride		45		10	mg/L	300.0
Ammonia		69		1.0	mg/L	L107-06-1B
Specific Conductance		1200		1.0	umhos/cm	SM 2510B
Dissolved						
Chromium		4.8	J	5.0	ug/L	6010B
360-25552-11	OC-PZ-16RR					
Sulfate		970		20	mg/L	300.0
Chloride		190		10	mg/L	300.0
Ammonia		230		2.0	mg/L	L107-06-1B
Specific Conductance		3000		1.0	umhos/cm	SM 2510B
Dissolved						
Chromium		6.5		5.0	ug/L	6010B
360-25552-12	OC-PZ-17RR					
Sulfate		470		20	mg/L	300.0
Chloride		18		1.0	mg/L	300.0
Ammonia		58		1.0	mg/L	L107-06-1B
Specific Conductance		1400		1.0	umhos/cm	SM 2510B
Dissolved						
Chromium		3.0	J	5.0	ug/L	6010B
360-25552-13	OC-PZ-18R					
Sulfate		80		2.0	mg/L	300.0
Chloride		79		5.0	mg/L	300.0
Ammonia		26		0.20	mg/L	L107-06-1B
Specific Conductance		570		1.0	umhos/cm	SM 2510B
Dissolved						
Chromium		13		5.0	ug/L	6010B
360-25552-14	OC-GW-34SR					
Sulfate		8.0		2.0	mg/L	300.0
Chloride		1.2		1.0	mg/L	300.0
Ammonia		0.24		0.10	mg/L	L107-06-1B
Specific Conductance		83		1.0	umhos/cm	SM 2510B

Lab Sample ID CI Analyte	ient Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-25552-15	OC-GW-34D				
Sulfate		29	2.0	mg/L	300.0
Chloride		15	1.0	mg/L	300.0
Ammonia		16	0.10	mg/L	L107-06-1B
Specific Conductance		210	1.0	umhos/cm	SM 2510B
Dissolved					
Chromium		14	5.0	ug/L	6010B
360-25552-16	OC-GW-CA-1				
Sulfate		86	2.0	mg/L	300.0
Chloride		6.0	1.0	mg/L	300.0
Ammonia		1.1	0.10	mg/L	L107-06-1B
Specific Conductance		600	1.0	umhos/cm	SM 2510B
Dissolved					
Chromium		3.3 J	5.0	ug/L	6010B
360-25552-17	OC-GW-35S				
Sulfate		190	10	mg/L	300.0
Chloride		7.0	1.0	mg/L	300.0
Ammonia		23	0.20	mg/L	L107-06-1B
Specific Conductance		710	1.0	umhos/cm	SM 2510B
Dissolved					
Chromium		19	5.0	ug/L	6010B
360-25552-18	OC-GW-202D				
Sulfate		1700	40	mg/L	300.0
Chloride		250	10	mg/L	300.0
Ammonia		260	2.0	mg/L	L107-06-1B
Specific Conductance		4000	1.0	umhos/cm	SM 2510B
Dissolved					
Aluminum		11000	100	ug/L	6010B
Chromium		770	5.0	ug/L	6010B

Lab Sample ID Client Sample ID			Reporting			
Analyte		Result / Qualif	ier Limit	Units	Method	
360-25552-19	OC-GW-34D DUP					
Sulfate		29	2.0	mg/L	300.0	
Chloride		15	1.0	mg/L	300.0	
Ammonia		15	0.10	mg/L	L107-06-1B	
Specific Conductance		210	1.0	umhos/cm	SM 2510B	
Dissolved						
Chromium		14	5.0	ug/L	6010B	
360-25552-20	OC-GW-202S DUP					
Sulfate		390	10	mg/L	300.0	
Chloride		51	5.0	mg/L	300.0	
Ammonia		67	1.0	mg/L	L107-06-1B	
Specific Conductance		1200	1.0	umhos/cm	SM 2510B	
Dissolved						
Chromium		4.2	J 5.0	ug/L	6010B	

#### **METHOD SUMMARY**

Client: Olin Corporation Job Number: 360-25552-1

Description	Lab Location	Method Preparation Method
Matrix: Water		
Dissolved Metals Sample Filtration, Field	TAL WFD TAL WFD	SW846 6010B FIELD_FLTRD
Chloride & Sulfate	TAL WFD	40CFR136A 300.0
Nitrogen Ammonia Distillation, Ammonia	TAL WFD TAL WFD	LACHAT L107-06-1B Distill/Ammonia
Conductivity, Specific Conductance	TAL WFD	SM SM 2510B

#### Lab References:

TAL WFD = TestAmerica Westfield

#### **Method References:**

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

## METHOD / ANALYST SUMMARY

Method	Analyst	Analyst ID
SW846 6010B	Smith, Tim J	TJS
40CFR136A 300.0	Lalashius, Andrew L	ALL
LACHAT L107-06-1B	Lalashius, Andrew L	ALL
SM SM 2510B	Emerich, Rich W	RWE

## **SAMPLE SUMMARY**

			Date/Time	Date/Time
Lab Sample ID	Client Sample ID	Client Matrix	Sampled	Received
360-25552-1	OC-GW-42S	Ground Water	11/09/2009 1055	11/11/2009 1715
360-25552-2	OC-GW-201S	Ground Water	11/09/2009 1405	11/11/2009 1715
360-25552-3	OC-GW-10S	Ground Water	11/10/2009 0945	11/11/2009 1715
360-25552-4	OC-GW-26	Ground Water	11/10/2009 0950	11/11/2009 1715
360-25552-5	OC-GW-76S	Ground Water	11/10/2009 1110	11/11/2009 1715
360-25552-6	OC-GW-24	Ground Water	11/10/2009 1050	11/11/2009 1715
360-25552-7	OC-GW-25	Ground Water	11/10/2009 1145	11/11/2009 1715
360-25552-8	OC-GW-79S	Ground Water	11/10/2009 1240	11/11/2009 1715
360-25552-9	OC-GW-78S	Ground Water	11/11/2009 1245	11/11/2009 1715
360-25552-10	OC-GW-202S	Ground Water	11/11/2009 1128	11/11/2009 1715
360-25552-10MS	OC-GW-202S MS	Ground Water	11/11/2009 1128	11/11/2009 1715
360-25552-10MSD	OC-GW-202S MSD	Ground Water	11/11/2009 1128	11/11/2009 1715
360-25552-11	OC-PZ-16RR	Ground Water	11/10/2009 1305	11/11/2009 1715
360-25552-12	OC-PZ-17RR	Ground Water	11/10/2009 1350	11/11/2009 1715
360-25552-13	OC-PZ-18R	Ground Water	11/10/2009 1505	11/11/2009 1715
360-25552-14	OC-GW-34SR	Ground Water	11/11/2009 0907	11/11/2009 1715
360-25552-15	OC-GW-34D	Ground Water	11/11/2009 0905	11/11/2009 1715
360-25552-15MS	OC-GW-34D MS	Ground Water	11/11/2009 1020	11/11/2009 1715
360-25552-15MSD	OC-GW-34D MSD	Ground Water	11/11/2009 1040	11/11/2009 1715
360-25552-16	OC-GW-CA-1	Ground Water	11/11/2009 1150	11/11/2009 1715
360-25552-17	OC-GW-35S	Ground Water	11/11/2009 1040	11/11/2009 1715
360-25552-18	OC-GW-202D	Ground Water	11/11/2009 1150	11/11/2009 1715
360-25552-19	OC-GW-34D DUP	Ground Water	11/11/2009 0905	11/11/2009 1715
360-25552-20	OC-GW-202S DUP	Ground Water	11/11/2009 1128	11/11/2009 1715

# **SAMPLE RESULTS**

3855 North Ocoee Street

Suite 200

Cleveland, TN 37312-4441

Client Sample ID: OC-GW-42S Lab Sample ID: 360-25552-1 Date Received: 11/11/2009 1715

Date Sampled: 11/09/2009 1055

Client Matrix:

**Ground Water** 

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date An	alyzed: 11	1/13/2009 1230	
Chromium	6.6	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B		Date An	alyzed: 11	1/16/2009 1636	
Aluminum	260	ug/L	39	100	1.0

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Lab Sample ID:

Client Sample ID: OC-GW-42S

360-25552-1

Date Sampled: 11/09/2009 1055
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Analyzed: 11/16/2009 22			
Sulfate	6.4	mg/L	2.0	2.0	1.0
Chloride	44	mg/L	1.0	1.0	1.0
Method: L107-06-1B		Date Anal	yzed:	11/18/2009 1530	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/18/2009 1245	
Ammonia	0.21	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Analyzed:		11/12/2009 1542	
Specific Conductance	220	umhos/cm	1.0	1.0	1.0

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Suite 200

Cleveland, TN 37312-4441

Date Sampled: 11/09/2009 1405 Client Sample ID: OC-GW-201S Date Received: 11/11/2009 1715 Lab Sample ID: 360-25552-2 Client Matrix: **Ground Water** 

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date An	alyzed: 11/1	3/2009 1233	
Chromium	11	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B		Date An	alyzed: 11/1	6/2009 1639	
Aluminum	ND	ug/L	39	100	1.0

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 Client Sample ID:
 OC-GW-201S
 Date Sampled:
 11/09/2009 1405

 Lab Sample ID:
 360-25552-2
 Date Received:
 11/11/2009 1715

Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/18/2009 2101	
Chloride	60	mg/L	10	10	10
Method: 300.0		Date Anal	yzed:	11/18/2009 2116	
Sulfate	1300	mg/L	40	40	20
Method: L107-06-1B		Date Analyzed:		11/24/2009 1556	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 0906	
Ammonia	130	mg/L	1.0	1.0	10
Method: SM 2510B		Date Anal	yzed:	11/12/2009 1543	
Specific Conductance	2800	umhos/cm	1.0	1.0	1.0

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Client Sample ID: OC-GW-10S Lab Sample ID: 360-25552-3 Date Sampled: 11/10/2009 0945
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Ar	nalyzed: 11/	13/2009 1236	
Chromium	ND	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B		Date Ar	nalyzed: 11/	16/2009 1642	
Aluminum	4300	ug/L	39	100	1.0

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 Client Sample ID:
 OC-GW-10S
 Date Sampled:
 11/10/2009 0945

 Lab Sample ID:
 360-25552-3
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/19/2009 0334	
Sulfate	130	mg/L	10	10	5.0
Chloride	31	mg/L	5.0	5.0	5.0
Method: L107-06-1B		Date Anal	yzed:	11/24/2009 1513	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 0906	
Ammonia	7.8	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Anal	yzed:	11/12/2009 1545	
Specific Conductance	390	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow

Job Number: 360-25552-1

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

 Client Sample ID:
 OC-GW-26
 Date Sampled:
 11/10/2009 0950

 Lab Sample ID:
 360-25552-4
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Ar	nalyzed: 11	/13/2009 1239	
Chromium	6.9	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B		Date Ar	nalyzed: 11	/16/2009 1645	
Aluminum	ND	ua/L	39	100	1.0

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Cleveland, TN 37312-4441

 Client Sample ID:
 OC-GW-26
 Date Sampled:
 11/10/2009 0950

 Lab Sample ID:
 360-25552-4
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/17/2009 0054	
Sulfate	68	mg/L	2.0	2.0	1.0
Chloride	18	mg/L	1.0	1.0	1.0
Method: L107-06-1B		Date Anal	yzed:	11/24/2009 1557	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 0906	
Ammonia	28	mg/L	0.50	0.50	5.0
Method: SM 2510B		Date Anal	yzed:	11/12/2009 1546	
Specific Conductance	360	umhos/cm	1.0	1.0	1.0

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Cleveland, TN 37312-4441

 Client Sample ID:
 OC-GW-76S
 Date Sampled:
 11/10/2009 1110

 Lab Sample ID:
 360-25552-5
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qua	alifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date An	alyzed: 1	11/13/2009 1242	
Chromium	2.0	J	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B			Date An	alyzed: 1	11/16/2009 1647	
Aluminum	ND		ug/L	39	100	1.0

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 Client Sample ID:
 OC-GW-76S
 Date Sampled:
 11/10/2009 1110

 Lab Sample ID:
 360-25552-5
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/17/2009 0109	
Sulfate	35	mg/L	2.0	2.0	1.0
Chloride	3.1	mg/L	1.0	1.0	1.0
Method: L107-06-1B		Date Anal	yzed:	11/24/2009 1515	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 0906	
Ammonia	8.3	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Anal	yzed:	11/12/2009 1548	
Specific Conductance	150	umhos/cm	1.0	1.0	1.0

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Client Sample ID: OC-GW-24 Lab Sample ID: 360-25552-6 Date Sampled: 11/10/2009 1050 Date Received: 11/11/2009 1715 Client Matrix: **Ground Water** 

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Ar	nalyzed: 11/1	3/2009 1245	
Chromium	ND	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B		Date Ar	nalyzed: 11/1	6/2009 1650	
Aluminum	ND	ug/L	39	100	1.0

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 Client Sample ID:
 OC-GW-24
 Date Sampled:
 11/10/2009 1050

 Lab Sample ID:
 360-25552-6
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/17/2009 0124	
Sulfate	62	mg/L	2.0	2.0	1.0
Chloride	6.5	mg/L	1.0	1.0	1.0
Method: L107-06-1B		Date Anal	yzed:	11/24/2009 1558	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 0906	
Ammonia	38	mg/L	0.50	0.50	5.0
Method: SM 2510B		Date Anal	yzed:	11/12/2009 1549	
Specific Conductance	360	umhos/cm	1.0	1.0	1.0

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 Client Sample ID:
 OC-GW-25
 Date Sampled:
 11/10/2009 1145

 Lab Sample ID:
 360-25552-7
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qua	lifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Ar	nalyzed: 11/1	3/2009 1248	
Chromium	1.6	J	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B			Date Ar	nalyzed: 11/1	6/2009 1653	
Aluminum	ND		ug/L	39	100	1.0

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 Client Sample ID:
 OC-GW-25
 Date Sampled:
 11/10/2009 1145

 Lab Sample ID:
 360-25552-7
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Analy	yzed:	11/18/2009 2203	
Sulfate	100	mg/L	10	10	5.0
Chloride	63	mg/L	5.0	5.0	5.0
Method: L107-06-1B		Date Analy	yzed:	11/24/2009 1559	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 0906	
Ammonia	41	mg/L	1.0	1.0	10
Method: SM 2510B		Date Analy	yzed:	11/12/2009 1551	
Specific Conductance	640	umhos/cm	1.0	1.0	1.0

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Client Sample ID: OC-GW-79S Lab Sample ID: 360-25552-8 Date Sampled: 11/10/2009 1240
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Ar	nalyzed: 1	1/13/2009 1250	
Chromium	8.9	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B		Date Ar	nalyzed: 1°	1/16/2009 1702	
Aluminum	ND	ua/L	39	100	1.0

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Client Sample ID: OC-GW-79S Lab Sample ID: 360-25552-8 Date Sampled: 11/10/2009 1240
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/18/2009 2219	
Chloride	210	mg/L	10	10	10
Method: 300.0		Date Anal	yzed:	11/18/2009 2234	
Sulfate	1400	mg/L	40	40	20
Method: L107-06-1B		Date Anal	yzed:	11/24/2009 1600	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 0906	
Ammonia	190	mg/L	2.0	2.0	20
Method: SM 2510B		Date Anal	yzed:	11/12/2009 1552	
Specific Conductance	3400	umhos/cm	1.0	1.0	1.0

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 Client Sample ID:
 OC-GW-78S
 Date Sampled:
 11/11/2009 1245

 Lab Sample ID:
 360-25552-9
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte Result/Qualifier Unit MDL RLDilution 11/13/2009 1300 Method: Dissolved-6010B Date Analyzed: Chromium 2.1 J ug/L 1.3 5.0 1.0 11/16/2009 1705 Method: Dissolved-6010B Date Analyzed: ND 100 1.0 Aluminum ug/L 39

Mr. Steven Morrow

Job Number: 360-25552-1

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

 Client Sample ID:
 OC-GW-78S
 Date Sampled:
 11/11/2009 1245

 Lab Sample ID:
 360-25552-9
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/17/2009 0237	
Chloride	22	mg/L	1.0	1.0	1.0
Method: 300.0		Date Analyzed: 11/18/2009 2		11/18/2009 2249	
Sulfate	540	mg/L	20	20	10
Method: L107-06-1B		Date Anal	yzed:	11/24/2009 1601	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 0906	
Ammonia	61	mg/L	1.0	1.0	10
Method: SM 2510B		Date Anal	yzed:	11/12/2009 1620	
Specific Conductance	1300	umhos/cm	1.0	1.0	1.0

11/11/2009 1128

11/11/2009 1715

**Ground Water** 

3855 North Ocoee Street

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Cleveland, TN 37312-4441

Client Sample ID: OC-GW-202S Date Sampled: Date Received: Lab Sample ID: 360-25552-10 Client Matrix:

Analyte Result/Qualifier Unit MDL RLDilution 11/13/2009 1213 Method: Dissolved-6010B Date Analyzed: Chromium 4.8 J ug/L 1.3 5.0 1.0 11/16/2009 1619 Method: Dissolved-6010B Date Analyzed: ND 100 1.0 Aluminum ug/L 39

3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

 Client Sample ID:
 OC-GW-202S
 Date Sampled:
 11/11/2009
 1128

 Lab Sample ID:
 360-25552-10
 Date Received:
 11/11/2009
 1715

Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/16/2009 2137	
Sulfate	380	mg/L	20	20	10
Chloride	45	mg/L	10	10	10
Method: L107-06-1B		Date Anal	yzed:	11/18/2009 1541	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/18/2009 1245	
Ammonia	69	mg/L	1.0	1.0	10
Method: SM 2510B		Date Anal	yzed:	11/12/2009 1622	
Specific Conductance	1200	umhos/cm	1.0	1.0	1.0

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 Client Sample ID:
 OC-PZ-16RR
 Date Sampled:
 11/10/2009 1305

 Lab Sample ID:
 360-25552-11
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date An	alyzed: 11/1	3/2009 1315	
Chromium	6.5	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B		Date An	alyzed: 11/1	6/2009 1719	
Aluminum	ND	ug/L	39	100	1.0

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 Client Sample ID:
 OC-PZ-16RR
 Date Sampled:
 11/10/2009 1305

 Lab Sample ID:
 360-25552-11
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/18/2009 2304	
Sulfate	970	mg/L	20	20	10
Chloride	190	mg/L	10	10	10
Method: L107-06-1B		Date Anal	yzed:	11/24/2009 1602	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 0906	
Ammonia	230	mg/L	2.0	2.0	20
Method: SM 2510B		Date Anal	yzed:	11/12/2009 1625	
Specific Conductance	3000	umhos/cm	1.0	1.0	1.0

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 Client Sample ID:
 OC-PZ-17RR
 Date Sampled:
 11/10/2009 1350

 Lab Sample ID:
 360-25552-12
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Quali	ifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Ar	nalyzed: 11/1	3/2009 1318	
Chromium	3.0	J	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B			Date Ar	nalyzed: 11/1	6/2009 1722	
Aluminum	ND		ua/L	39	100	1.0

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 Client Sample ID:
 OC-PZ-17RR
 Date Sampled:
 11/10/2009 1350

 Lab Sample ID:
 360-25552-12
 Date Received:
 11/11/2009 1715

Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/17/2009 0310	
Chloride	18	mg/L	1.0	1.0	1.0
Method: 300.0		Date Analyzed: 11/19/2009 0004		11/19/2009 0004	
Sulfate	470	mg/L	20	20	10
Method: L107-06-1B		Date Anal	yzed:	11/24/2009 1603	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 0906	
Ammonia	58	mg/L	1.0	1.0	10
Method: SM 2510B		Date Anal	yzed:	11/12/2009 1626	
Specific Conductance	1400	umhos/cm	1.0	1.0	1.0

3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

 Client Sample ID:
 OC-PZ-18R
 Date Sampled:
 11/10/2009 1505

 Lab Sample ID:
 360-25552-13
 Date Received:
 11/11/2009 1715

Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Ar	nalyzed: 1	11/13/2009 1321	
Chromium	13	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B		Date Ar	nalyzed: 1	11/16/2009 1725	
Aluminum	ND	ug/L	39	100	1.0

3855 North Ocoee Street Suite 200

Cleveland, TN 37312-4441

 Client Sample ID:
 OC-PZ-18R
 Date Sampled:
 11/10/2009 1505

 Lab Sample ID:
 360-25552-13
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/17/2009 0325	
Sulfate	80	mg/L	2.0	2.0	1.0
Method: 300.0		Date Anal	yzed:	11/19/2009 0019	
Chloride	79	mg/L	5.0	5.0	5.0
Method: L107-06-1B		Date Anal	yzed:	11/24/2009 1604	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 0906	
Ammonia	26	mg/L	0.20	0.20	2.0
Method: SM 2510B		Date Anal	yzed:	11/12/2009 1628	
Specific Conductance	570	umhos/cm	1.0	1.0	1.0

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Client Sample ID: OC-GW-34SR Lab Sample ID: 360-25552-14 
 Date Sampled:
 11/11/2009 0907

 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Ar	nalyzed: 11	/13/2009 1324	
Chromium	ND	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B		Date Ar	nalyzed: 11	/16/2009 1728	
Aluminum	ND	ua/L	39	100	1.0

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Suite 200

Cleveland, TN 37312-4441

Client Sample ID: OC-GW-34SR Lab Sample ID: 360-25552-14

Date Sampled: 11/11/2009 0907 Date Received: 11/11/2009 1715

Client Matrix: **Ground Water** 

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed: 1	11/17/2009 0340	
Sulfate	8.0	mg/L	2.0	2.0	1.0
Chloride	1.2	mg/L	1.0	1.0	1.0
Method: L107-06-1B		Date Anal	yzed: 1	11/24/2009 1525	
Prep Method: Distill/Ammonia		Date Prep	ared: 1	11/24/2009 0906	
Ammonia	0.24	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Anal	yzed: 1	11/12/2009 1629	
Specific Conductance	83	umhos/cm	1.0	1.0	1.0

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 Client Sample ID:
 OC-GW-34D
 Date Sampled:
 11/11/2009 0905

 Lab Sample ID:
 360-25552-15
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Ar	nalyzed: 11/1	3/2009 1303	
Chromium	14	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B		Date Ar	nalyzed: 11/1	6/2009 1708	
Aluminum	ND	ug/L	39	100	1.0

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 Client Sample ID:
 OC-GW-34D
 Date Sampled:
 11/11/2009 0905

 Lab Sample ID:
 360-25552-15
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/16/2009 2338	
Sulfate	29	mg/L	2.0	2.0	1.0
Chloride	15	mg/L	1.0	1.0	1.0
Method: L107-06-1B		Date Anal	yzed:	11/24/2009 1525	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 0906	
Ammonia	16	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Anal	yzed:	11/12/2009 1631	
Specific Conductance	210	umhos/cm	1.0	1.0	1.0

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Client Sample ID: OC-GW-CA-1
Lab Sample ID: 360-25552-16

Date Sampled: 11/11/2009 1150
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qua	alifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date An	nalyzed: 1	11/13/2009 1326	
Chromium	3.3	J	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B			Date An	nalyzed: 1	11/16/2009 1737	
Aluminum	ND		ug/L	39	100	1.0

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 Client Sample ID:
 OC-GW-CA-1
 Date Sampled:
 11/11/2009 1150

 Lab Sample ID:
 360-25552-16
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed: 1	1/17/2009 0355	
Sulfate	86	mg/L	2.0	2.0	1.0
Chloride	6.0	mg/L	1.0	1.0	1.0
Method: L107-06-1B		Date Anal	yzed: 1	1/24/2009 1528	
Prep Method: Distill/Ammonia		Date Prep	ared: 1	1/24/2009 0906	
Ammonia	1.1	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Anal	yzed: 1	1/12/2009 1634	
Specific Conductance	600	umhos/cm	1.0	1.0	1.0

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 Client Sample ID:
 OC-GW-35S
 Date Sampled:
 11/11/2009 1040

 Lab Sample ID:
 360-25552-17
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte Result/Qualifier Unit MDL RLDilution 11/13/2009 1335 Method: Dissolved-6010B Date Analyzed: ND Aluminum ug/L 100 1.0 Chromium 19 ug/L 1.3 5.0 1.0

Mr. Steven Morrow

Job Number: 360-25552-1

Olin Corporation 3855 North Ocoee Street Suite 200

Cleveland, TN 37312-4441

 Client Sample ID:
 OC-GW-35S
 Date Sampled:
 11/11/2009 1040

 Lab Sample ID:
 360-25552-17
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/17/2009 0409	
Chloride	7.0	mg/L	1.0	1.0	1.0
Method: 300.0		Date Anal	yzed:	11/19/2009 0035	
Sulfate	190	mg/L	10	10	5.0
Method: L107-06-1B		Date Anal	yzed:	11/24/2009 1609	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 0906	
Ammonia	23	mg/L	0.20	0.20	2.0
Method: SM 2510B		Date Anal	yzed:	11/12/2009 1635	
Specific Conductance	710	umhos/cm	1.0	1.0	1.0

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Client Sample ID: OC-GW-202D Lab Sample ID: 360-25552-18 Date Sampled: 11/11/2009 1150
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Ar	nalyzed: 11/1	3/2009 1338	
Aluminum	11000	ug/L	39	100	1.0
Chromium	770	ug/L	1.3	5.0	1.0

Mr. Steven Morrow

Job Number: 360-25552-1

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 Client Sample ID:
 OC-GW-202D
 Date Sampled:
 11/11/2009 1150

 Lab Sample ID:
 360-25552-18
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/19/2009 0050	
Chloride	250	mg/L	10	10	10
Method: 300.0		Date Anal	yzed:	11/19/2009 0105	
Sulfate	1700	mg/L	40	40	20
Method: L107-06-1B		Date Anal	yzed:	11/24/2009 1610	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 0906	
Ammonia	260	mg/L	2.0	2.0	20
Method: SM 2510B		Date Anal	yzed:	11/13/2009 1016	
Specific Conductance	4000	umhos/cm	1.0	1.0	1.0

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 Client Sample ID:
 OC-GW-34D DUP
 Date Sampled:
 11/11/2009 0905

 Lab Sample ID:
 360-25552-19
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Ar	nalyzed: 11/	13/2009 1341	
Aluminum	ND	ug/L	39	100	1.0
Chromium	14	ua/L	1.3	5.0	1.0

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 Client Sample ID:
 OC-GW-34D DUP
 Date Sampled:
 11/11/2009 0905

 Lab Sample ID:
 360-25552-19
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/17/2009 0438	
Sulfate	29	mg/L	2.0	2.0	1.0
Chloride	15	mg/L	1.0	1.0	1.0
Method: L107-06-1B		Date Analyzed: 11/24/2009 1535			
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 1333	
Ammonia	15	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Anal	yzed:	11/12/2009 1642	
Specific Conductance	210	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow

Job Number: 360-25552-1

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Cleveland, TN 37312-4441

 Client Sample ID:
 OC-GW-202S DUP
 Date Sampled:
 11/11/2009 1128

 Lab Sample ID:
 360-25552-20
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Ar	nalyzed: 11/1	3/2009 1344	
Aluminum	ND	ug/L	39	100	1.0
Chromium	4.2 J	ug/L	1.3	5.0	1.0

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 Client Sample ID:
 OC-GW-202S DUP
 Date Sampled:
 11/11/2009 1128

 Lab Sample ID:
 360-25552-20
 Date Received:
 11/11/2009 1715

 Client Matrix:
 Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/19/2009 0120	
Sulfate	390	mg/L	10	10	5.0
Chloride	51	mg/L	5.0	5.0	5.0
Method: L107-06-1B		Date Analyzed: 1		11/24/2009 1611	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 1333	
Ammonia	67	mg/L	1.0	1.0	10
Method: SM 2510B		Date Anal	yzed:	11/12/2009 1644	
Specific Conductance	1200	umhos/cm	1.0	1.0	1.0

## **DATA REPORTING QUALIFIERS**

Client: Olin Corporation Job Number: 360-25552-1

Lab Section	Qualifier	Description
Metals		
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
General Chemistry		
	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.

# **QUALITY CONTROL RESULTS**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals	·				·
Analysis Batch:360-5164	45				
LCS 360-51645/13	Lab Control Sample	Т	Water	6010B	
LCSD 360-51645/25	Lab Control Sample Duplicate	Т	Water	6010B	
MB 360-51645/14	Method Blank	Т	Water	6010B	
360-25552-1	OC-GW-42S	D	Water	6010B	
360-25552-2	OC-GW-201S	D	Water	6010B	
360-25552-3	OC-GW-10S	D	Water	6010B	
360-25552-4	OC-GW-26	D	Water	6010B	
360-25552-5	OC-GW-76S	D	Water	6010B	
360-25552-6	OC-GW-24	D	Water	6010B	
360-25552-7	OC-GW-25	D	Water	6010B	
360-25552-8	OC-GW-79S	D	Water	6010B	
360-25552-9	OC-GW-78S	D	Water	6010B	
360-25552-10	OC-GW-202S	D	Water	6010B	
360-25552-10MS	Matrix Spike	D	Water	6010B	
360-25552-10MSD	Matrix Spike Duplicate	D	Water	6010B	
Analysis Batch:360-5164	46				
LCS 360-51646/1	Lab Control Sample	Т	Water	6010B	
LCSD 360-51646/12	Lab Control Sample Duplicate	Т	Water	6010B	
MB 360-51646/2	Method Blank	Т	Water	6010B	
360-25552-11	OC-PZ-16RR	D	Water	6010B	
360-25552-12	OC-PZ-17RR	D	Water	6010B	
360-25552-13	OC-PZ-18R	D	Water	6010B	
360-25552-14	OC-GW-34SR	D	Water	6010B	
360-25552-15	OC-GW-34D	D	Water	6010B	
360-25552-15MS	Matrix Spike	D	Water	6010B	
360-25552-15MSD	Matrix Spike Duplicate	D	Water	6010B	
360-25552-16	OC-GW-CA-1	D	Water	6010B	
360-25552-17	OC-GW-35S	D	Water	6010B	
360-25552-18	OC-GW-202D	D	Water	6010B	
360-25552-19	OC-GW-34D DUP	D	Water	6010B	
360-25552-20	OC-GW-202S DUP	D	Water	6010B	

## **QC Association Summary**

		Report			
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:360-51728					
LCS 360-51728/4	Lab Control Sample	T	Water	6010B	
LCSD 360-51728/16	Lab Control Sample Duplicate	T	Water	6010B	
MB 360-51728/5	Method Blank	T	Water	6010B	
360-25552-1	OC-GW-42S	D	Water	6010B	
360-25552-2	OC-GW-201S	D	Water	6010B	
360-25552-3	OC-GW-10S	D	Water	6010B	
360-25552-4	OC-GW-26	D	Water	6010B	
360-25552-5	OC-GW-76S	D	Water	6010B	
360-25552-6	OC-GW-24	D	Water	6010B	
360-25552-7	OC-GW-25	D	Water	6010B	
360-25552-8	OC-GW-79S	D	Water	6010B	
360-25552-9	OC-GW-78S	D	Water	6010B	
360-25552-10	OC-GW-202S	D	Water	6010B	
360-25552-10MS	Matrix Spike	D	Water	6010B	
360-25552-10MSD	Matrix Spike Duplicate	D	Water	6010B	
Analysis Batch:360-51729					
LCS 360-51729/1	Lab Control Sample	Т	Water	6010B	
LCSD 360-51729/11	Lab Control Sample Duplicate	Т	Water	6010B	
MB 360-51729/2	Method Blank	Т	Water	6010B	
360-25552-11	OC-PZ-16RR	D	Water	6010B	
360-25552-12	OC-PZ-17RR	D	Water	6010B	
360-25552-13	OC-PZ-18R	D	Water	6010B	
360-25552-14	OC-GW-34SR	D	Water	6010B	
360-25552-15	OC-GW-34D	D	Water	6010B	
360-25552-15MS	Matrix Spike	D	Water	6010B	
360-25552-15MSD	Matrix Spike Duplicate	D	Water	6010B	
360-25552-16	OC-GW-CA-1	D	Water	6010B	

#### Report Basis

D = Dissolved

T = Total

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-516	508				
LCS 360-51608/3	Lab Control Sample	Т	Water	SM 2510B	
MB 360-51608/1	Method Blank	Т	Water	SM 2510B	
360-25552-1	OC-GW-42S	Т	Water	SM 2510B	
360-25552-2	OC-GW-201S	Т	Water	SM 2510B	
360-25552-3	OC-GW-10S	Т	Water	SM 2510B	
360-25552-4	OC-GW-26	Т	Water	SM 2510B	
360-25552-5	OC-GW-76S	Т	Water	SM 2510B	
360-25552-6	OC-GW-24	Т	Water	SM 2510B	
360-25552-7	OC-GW-25	Т	Water	SM 2510B	
360-25552-8	OC-GW-79S	Т	Water	SM 2510B	
360-25552-9	OC-GW-78S	Т	Water	SM 2510B	
360-25552-10	OC-GW-202S	T	Water	SM 2510B	
360-25552-10DU	Duplicate	T	Water	SM 2510B	
360-25552-11	OC-PZ-16RR	T	Water	SM 2510B	
360-25552-12	OC-PZ-17RR	T	Water	SM 2510B	
360-25552-13	OC-PZ-18R	T.	Water	SM 2510B	
360-25552-14	OC-GW-34SR	T.	Water	SM 2510B	
360-25552-15	OC-GW-34D	T.	Water	SM 2510B	
360-25552-15DU	Duplicate	T	Water	SM 2510B	
360-25552-16	OC-GW-CA-1	T T	Water	SM 2510B	
360-25552-17	OC-GW-35S	T	Water	SM 2510B	
360-25552-18	OC-GW-202D	Ť	Water	SM 2510B	
000 20002 10	00 0W 202B	,	Water	CIVI ZOTOB	
Analysis Batch:360-516	609				
_CS 360-51609/2	Lab Control Sample	Т	Water	SM 2510B	
MB 360-51609/1	Method Blank	Т	Water	SM 2510B	
360-25552-19	OC-GW-34D DUP	Т	Water	SM 2510B	
360-25552-20	OC-GW-202S DUP	Т	Water	SM 2510B	
360-25552-20DU	Duplicate	Т	Water	SM 2510B	
Analysis Batch: 250 543	747				
Analysis Batch:360-517		Т	Water	300.0	
_CS 360-51747/4 MB 360-51747/3	Lab Control Sample Method Blank	T T	Water	300.0	
		T			
360-25552-1 260-25552-10	OC-GW-42S	T T	Water	300.0	
360-25552-10 360-25552-10MS	OC-GW-202S		Water	300.0	
360-25552-10MS	Matrix Spike	T	Water	300.0	
360-25552-10MSD	Matrix Spike Duplicate	Т	Water	300.0	

		Report					
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch		
General Chemistry							
Analysis Batch:360-51748	1						
_CS 360-51748/4	Lab Control Sample	T	Water	300.0			
MB 360-51748/3	Method Blank	Т	Water	300.0			
360-25552-4	OC-GW-26	T	Water	300.0			
360-25552-5	OC-GW-76S	Т	Water	300.0			
360-25552-6	OC-GW-24	Т	Water	300.0			
360-25552-9	OC-GW-78S	T	Water	300.0			
360-25552-12	OC-PZ-17RR	Т	Water	300.0			
360-25552-13	OC-PZ-18R	Т	Water	300.0			
360-25552-14	OC-GW-34SR	T	Water	300.0			
360-25552-15	OC-GW-34D	Т	Water	300.0			
360-25552-15MS	Matrix Spike	Т	Water	300.0			
360-25552-15MSD	Matrix Spike Duplicate	Т	Water	300.0			
360-25552-16	OC-GW-CA-1	Т	Water	300.0			
360-25552-17	OC-GW-35S	Т	Water	300.0			
360-25552-19	OC-GW-34D DUP	Т	Water	300.0			
Prep Batch: 360-51829							
_CS 360-51829/2-A	Lab Control Sample	Т	Water	Distill/Ammonia			
MB 360-51829/1-A	Method Blank	T	Water	Distill/Ammonia			
360-25552-1	OC-GW-42S	Т	Water	Distill/Ammonia			
360-25552-10	OC-GW-202S	Т	Water	Distill/Ammonia			
360-25552-10MS	Matrix Spike	Т	Water	Distill/Ammonia			
360-25552-10MSD	Matrix Spike Duplicate	Т	Water	Distill/Ammonia			
Analysis Batch:360-51839							
_CS 360-51829/2-A	Lab Control Sample	Т	Water	L107-06-1B	360-51829		
MB 360-51829/1-A	Method Blank	Т	Water	L107-06-1B	360-51829		
360-25552-1	OC-GW-42S	Т	Water	L107-06-1B	360-51829		
360-25552-10	OC-GW-202S	Т	Water	L107-06-1B	360-51829		
360-25552-10MS	Matrix Spike	Т	Water	L107-06-1B	360-51829		
360-25552-10MSD	Matrix Spike Duplicate	Т	Water	L107-06-1B	360-51829		

		Report				
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch	
General Chemistry						
Analysis Batch:360-519	58					
LCS 360-51958/4	Lab Control Sample	T	Water	300.0		
MB 360-51958/3	Method Blank	Т	Water	300.0		
360-25552-2	OC-GW-201S	Т	Water	300.0		
360-25552-2MS	Matrix Spike	Т	Water	300.0		
360-25552-2MSD	Matrix Spike Duplicate	Т	Water	300.0		
360-25552-7	OC-GW-25	Т	Water	300.0		
360-25552-8	OC-GW-79S	Т	Water	300.0		
360-25552-9	OC-GW-78S	Т	Water	300.0		
360-25552-11	OC-PZ-16RR	Т	Water	300.0		
360-25552-12	OC-PZ-17RR	Т	Water	300.0		
360-25552-13	OC-PZ-18R	Т	Water	300.0		
360-25552-17	OC-GW-35S	Т	Water	300.0		
360-25552-18	OC-GW-202D	Т	Water	300.0		
360-25552-20	OC-GW-202S DUP	Т	Water	300.0		
Analysis Batch:360-519	62					
LCS 360-51962/4	Lab Control Sample	Т	Water	300.0		
MB 360-51962/3	Method Blank	Т	Water	300.0		
360-25552-3	OC-GW-10S	Т	Water	300.0		
Prep Batch: 360-52108						
LCS 360-52108/2-A	Lab Control Sample	Т	Water	Distill/Ammonia		
MB 360-52108/1-A	Method Blank	Т	Water	Distill/Ammonia		
360-25552-2	OC-GW-201S	T	Water	Distill/Ammonia		
360-25552-3	OC-GW-10S	T	Water	Distill/Ammonia		
360-25552-4	OC-GW-26	T	Water	Distill/Ammonia		
360-25552-5	OC-GW-76S	T	Water	Distill/Ammonia		
360-25552-6	OC-GW-24	T	Water	Distill/Ammonia		
360-25552-7	OC-GW-25	T	Water	Distill/Ammonia		
360-25552-8	OC-GW-79S	Т	Water	Distill/Ammonia		
360-25552-9	OC-GW-78S	Т	Water	Distill/Ammonia		
360-25552-11	OC-PZ-16RR	T	Water	Distill/Ammonia		
360-25552-12	OC-PZ-17RR	T	Water	Distill/Ammonia		
360-25552-13	OC-PZ-18R	T	Water	Distill/Ammonia		
360-25552-14	OC-GW-34SR	T.	Water	Distill/Ammonia		
360-25552-15	OC-GW-34D	T	Water	Distill/Ammonia		
360-25552-15MS	Matrix Spike	T	Water	Distill/Ammonia		
360-25552-15MSD	Matrix Spike Duplicate	T.	Water	Distill/Ammonia		
360-25552-16	OC-GW-CA-1	T	Water	Distill/Ammonia		
360-25552-17	OC-GW-35S	T T	Water	Distill/Ammonia		
360-25552-18	OC-GW-202D	T	Water	Distill/Ammonia		
,00 <u>2000</u> 2 10	30 011 LULD	•		D.Still// tillifolila		

## **QC Association Summary**

		Report					
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch		
General Chemistry							
Prep Batch: 360-52128							
LCS 360-52128/2-A	Lab Control Sample	Т	Water	Distill/Ammonia			
MB 360-52128/1-A	Method Blank	T	Water	Distill/Ammonia			
360-25552-19	OC-GW-34D DUP	T	Water	Distill/Ammonia			
360-25552-20	OC-GW-202S DUP	Т	Water	Distill/Ammonia			
Analysis Batch:360-52155							
LCS 360-52108/2-A	Lab Control Sample	Т	Water	L107-06-1B	360-52108		
MB 360-52108/1-A	Method Blank	Т	Water	L107-06-1B	360-52108		
360-25552-2	OC-GW-201S	Т	Water	L107-06-1B	360-52108		
360-25552-3	OC-GW-10S	Т	Water	L107-06-1B	360-52108		
360-25552-4	OC-GW-26	Т	Water	L107-06-1B	360-52108		
360-25552-5	OC-GW-76S	Т	Water	L107-06-1B	360-52108		
360-25552-6	OC-GW-24	Т	Water	L107-06-1B	360-52108		
360-25552-7	OC-GW-25	Т	Water	L107-06-1B	360-52108		
360-25552-8	OC-GW-79S	Т	Water	L107-06-1B	360-52108		
360-25552-9	OC-GW-78S	Т	Water	L107-06-1B	360-52108		
360-25552-11	OC-PZ-16RR	Т	Water	L107-06-1B	360-52108		
360-25552-12	OC-PZ-17RR	Т	Water	L107-06-1B	360-52108		
360-25552-13	OC-PZ-18R	Т	Water	L107-06-1B	360-52108		
360-25552-14	OC-GW-34SR	Т	Water	L107-06-1B	360-52108		
360-25552-15	OC-GW-34D	Т	Water	L107-06-1B	360-52108		
360-25552-15MS	Matrix Spike	Т	Water	L107-06-1B	360-52108		
360-25552-15MSD	Matrix Spike Duplicate	Т	Water	L107-06-1B	360-52108		
360-25552-16	OC-GW-CA-1	Т	Water	L107-06-1B	360-52108		
360-25552-17	OC-GW-35S	Т	Water	L107-06-1B	360-52108		
360-25552-18	OC-GW-202D	Т	Water	L107-06-1B	360-52108		
Analysis Batch:360-52157							
LCS 360-52128/2-A	Lab Control Sample	Т	Water	L107-06-1B	360-52128		
MB 360-52128/1-A	Method Blank	Т	Water	L107-06-1B	360-52128		
360-25552-19	OC-GW-34D DUP	Т	Water	L107-06-1B	360-52128		
360-25552-20	OC-GW-202S DUP	Т	Water	L107-06-1B	360-52128		

#### Report Basis

T = Total

Client: Olin Corporation Job Number: 360-25552-1

Method Blank - Batch: 360-51645 Method: 6010B

Preparation: N/A

Initial Weight/Volume:

N/A

Lab File ID:

Lab Sample ID: MB 360-51645/14 Analysis Batch: 360-51645 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Dilution: 1.0 Units: ug/L

11/13/2009 1133 Date Analyzed: Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Chromium

Analyte Result Qual MDL RL Chromium ND 5.0 1.3

Method: 6010B Lab Control Sample/ Lab Control Sample Duplicate Recovery Report - Batch: 360-51645 Preparation: N/A

LCS Lab Sample ID: LCS 360-51645/13 Analysis Batch: 360-51645 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A Dilution: 1.0 Units: ug/L Initial Weight/Volume:

11/13/2009 1130 Date Analyzed: Final Weight/Volume:

10 mL Date Prepared: N/A

LCSD Lab Sample ID: LCSD 360-51645/25 Analysis Batch: 360-51645 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: ug/L Initial Weight/Volume: 11/13/2009 1219 Date Analyzed: Final Weight/Volume:

100

10 mL Date Prepared: N/A

99

% Rec. LCS LCSD Limit RPD RPD Limit LCS Qual LCSD Qual Analyte

80 - 120

2

20

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Olin Corporation Job Number: 360-25552-1

Matrix Spike/ Method: 6010B
Matrix Spike Duplicate Recovery Report - Batch: 360-51645 Preparation: N/A

MS Lab Sample ID: 360-25552-10 Analysis Batch: 360-51645 Instrument ID: Varian 720 ES ICP Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 11/13/2009 1216 Final Weight/Volume: 10 mL

Date Prepared: N/A

MSD Lab Sample ID: 360-25552-10 Analysis Batch: 360-51645 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 11/13/2009 1224 Final Weight/Volume: 10 mL

Date Prepared: N/A

 MS
 MSD
 Limit
 RPD
 RPD Limit
 MS Qual
 MSD Qual

 Chromium
 95
 95
 75 - 125
 1
 20

Client: Olin Corporation Job Number: 360-25552-1

Method Blank - Batch: 360-51646 Method: 6010B Preparation: N/A

Analysis Batch: 360-51646 Lab Sample ID: MB 360-51646/2 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A Dilution: 1.0 Units: ug/L Initial Weight/Volume:

11/13/2009 1258 Date Analyzed: Final Weight/Volume: 1.0 mL

Date Prepared: N/A

RL Analyte Result Qual MDL ND 39 100 Aluminum Chromium ND 1.3 5.0

Lab Control Sample/ Method: 6010B Lab Control Sample Duplicate Recovery Report - Batch: 360-51646 Preparation: N/A

LCS Lab Sample ID: LCS 360-51646/1 Analysis Batch: 360-51646 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: ug/L Initial Weight/Volume: 11/13/2009 1255 Final Weight/Volume:

Date Analyzed: 10 mL

Date Prepared: N/A

LCSD Lab Sample ID: LCSD 360-51646/12 Analysis Batch: 360-51646 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: Units: ug/L 1.0 Initial Weight/Volume: 11/13/2009 1329 Date Analyzed: Final Weight/Volume: 10 mL

Date Prepared: N/A

96

93

% Rec. LCS LCSD Limit RPD RPD Limit LCS Qual LCSD Qual Analyte Aluminum 89 93 80 - 120 4 20

80 - 120

3

20

Calculations are performed before rounding to avoid round-off errors in calculated results.

Chromium

Client: Olin Corporation Job Number: 360-25552-1

Matrix Spike/ Method: 6010B

Matrix Spike Duplicate Recovery Report - Batch: 360-51646 Preparation: N/A

MS Lab Sample ID: 360-25552-15 Analysis Batch: 360-51646 Instrument ID: Varian 720 ES ICP Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 11/13/2009 1306 Final Weight/Volume: 10 mL
Date Prepared: N/A

MSD Lab Sample ID: 360-25552-15 Analysis Batch: 360-51646 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 11/13/2009 1309 Final Weight/Volume: 10 mL Date Prepared: N/A

 MS
 MSD
 Limit
 RPD
 RPD Limit
 MS Qual
 MSD Qual

 Chromium
 92
 97
 75 - 125
 4
 20

1.0 mL

Client: Olin Corporation Job Number: 360-25552-1

Method Blank - Batch: 360-51728 Method: 6010B

Preparation: N/A

Initial Weight/Volume:

N/A

Lab File ID:

Lab Sample ID: MB 360-51728/5 Analysis Batch: 360-51728 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Dilution: 1.0 Units: ug/L

11/16/2009 1624 Date Analyzed: Final Weight/Volume:

Date Prepared: N/A

RL Analyte Result Qual MDL Aluminum ND 39 100

Method: 6010B Lab Control Sample/ Lab Control Sample Duplicate Recovery Report - Batch: 360-51728 Preparation: N/A

LCS Lab Sample ID: LCS 360-51728/4 Analysis Batch: 360-51728 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A Dilution: 1.0 Units: ug/L Initial Weight/Volume:

11/16/2009 1621 Date Analyzed: Final Weight/Volume:

10 mL Date Prepared: N/A

LCSD Lab Sample ID: LCSD 360-51728/16 Analysis Batch: 360-51728 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A Dilution: 1.0 Units: ug/L Initial Weight/Volume:

11/16/2009 1656 Date Analyzed: Final Weight/Volume:

10 mL Date Prepared: N/A

% Rec. LCS LCSD Limit RPD RPD Limit LCS Qual LCSD Qual Analyte

Aluminum 99 101 80 - 120 2 20

Varian 720 ES ICP

Instrument ID:

Client: Olin Corporation Job Number: 360-25552-1

Matrix Spike/ Method: 6010B
Matrix Spike Duplicate Recovery Report - Batch: 360-51728 Preparation: N/A

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 11/16/2009 1627 Final Weight/Volume: 10 mL
Date Prepared: N/A

Analysis Batch: 360-51728

MSD Lab Sample ID: 360-25552-10 Analysis Batch: 360-51728 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 11/16/2009 1630 Final Weight/Volume: 10 mL

Date Prepared: N/A

<u>% Rec.</u>

360-25552-10

Analyte MS MSD Limit RPD RPD Limit MS Qual MSD Qual
Aluminum 97 102 75 - 125 5 20

MS Lab Sample ID:

Client: Olin Corporation Job Number: 360-25552-1

Method Blank - Batch: 360-51729 Method: 6010B

Preparation: N/A

Initial Weight/Volume:

20

N/A

Lab File ID:

Lab Sample ID: MB 360-51729/2 Analysis Batch: 360-51729 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Dilution: 1.0 Units: ug/L

11/16/2009 1659 Date Analyzed: Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Aluminum

RL Analyte Result Qual MDL Aluminum ND 39 100

Method: 6010B Lab Control Sample/

Lab Control Sample Duplicate Recovery Report - Batch: 360-51729 Preparation: N/A

LCS Lab Sample ID: LCS 360-51729/1 Analysis Batch: 360-51729 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A Dilution: 1.0 Units: ug/L Initial Weight/Volume:

11/16/2009 1656 Date Analyzed: Final Weight/Volume:

10 mL Date Prepared: N/A

LCSD Lab Sample ID: LCSD 360-51729/11 Analysis Batch: 360-51729 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: ug/L Initial Weight/Volume: 11/16/2009 1731 Date Analyzed: Final Weight/Volume:

101

10 mL Date Prepared: N/A

101

% Rec. LCS LCSD Limit RPD RPD Limit LCS Qual LCSD Qual Analyte

80 - 120

0

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Olin Corporation Job Number: 360-25552-1

Matrix Spike/ Method: 6010B
Matrix Spike Duplicate Recovery Report - Batch: 360-51729 Preparation: N/A

MS Lab Sample ID: 360-25552-15 Analysis Batch: 360-51729 Instrument ID: Varian 720 ES ICP Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 11/16/2009 1711 Final Weight/Volume: 10 mL

Date Prepared: N/A

MSD Lab Sample ID: 360-25552-15 Analysis Batch: 360-51729 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 11/16/2009 1714 Final Weight/Volume: 10 mL

Date Prepared: N/A

<u>% Rec.</u>

Analyte MS MSD Limit RPD RPD Limit MS Qual MSD Qual
Aluminum 104 104 75 - 125 0 20

Client: Olin Corporation Job Number: 360-25552-1

Method Blank - Batch: 360-51747 Method: 300.0 Preparation: N/A

Lab Sample ID: Analysis Batch: 360-51747 MB 360-51747/3 Instrument ID: No Equipment Assigned Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL Date Analyzed: 11/16/2009 1603 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Result RL RL Analyte Qual Sulfate ND 2.0 2.0 Chloride ND 1.0 1.0

Lab Control Sample - Batch: 360-51747 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-51747/4 Analysis Batch: 360-51747 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: Units: mg/L Initial Weight/Volume: 1.0 1.0 mL

Date Analyzed: 11/16/2009 1618 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual 80.0 85 - 115 Sulfate 79.5 99 40.0 102 85 - 115 Chloride 40.7

Calculations are performed before rounding to avoid round-off errors in calculated results.

1.0 mL

Client: Olin Corporation Job Number: 360-25552-1

Matrix Spike/ Method: 300.0 Matrix Spike Duplicate Recovery Report - Batch: 360-51747 Preparation: N/A

MS Lab Sample ID: Analysis Batch: 360-51747 360-25552-10 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID:

Dilution: 10 Initial Weight/Volume:

11/16/2009 2153 Final Weight/Volume: Date Analyzed: 10 mL

Date Prepared: N/A

MSD Lab Sample ID: 360-25552-10 Analysis Batch: 360-51747 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID:

Dilution: 10 Initial Weight/Volume:

1.0 mL Date Analyzed: 11/16/2009 2208 Final Weight/Volume: 10 mL

Date Prepared: N/A

% Rec. RPD Analyte MS MSD Limit **RPD Limit** MS Qual MSD Qual Sulfate 75 - 125 101 20 101 0 Chloride 107 106 75 - 125 0 20

Client: Olin Corporation Job Number: 360-25552-1

Method Blank - Batch: 360-51748 Method: 300.0 Preparation: N/A

Lab Sample ID: Analysis Batch: 360-51748 MB 360-51748/3 Instrument ID: No Equipment Assigned Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL Date Analyzed: 11/16/2009 2308 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Result RL RL Analyte Qual Sulfate ND 2.0 2.0 Chloride ND 1.0 1.0

Lab Control Sample - Batch: 360-51748 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-51748/4 Analysis Batch: 360-51748 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID:

Dilution: Units: mg/L Initial Weight/Volume: 1.0 1.0 mL

Date Analyzed: 11/16/2009 2323 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual 80.0 81.7 85 - 115 Sulfate 102 40.0 85 - 115 Chloride 41.1 103

Calculations are performed before rounding to avoid round-off errors in calculated results.

1.0 mL

Client: Olin Corporation Job Number: 360-25552-1

Matrix Spike/ Method: 300.0

Matrix Spike Duplicate Recovery Report - Batch: 360-51748 Preparation: N/A

MS Lab Sample ID: 360-25552-15 Analysis Batch: 360-51748 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 10 Initial Weight/Volume:

Date Analyzed: 11/17/2009 0008 Final Weight/Volume: 10 mL

Date Prepared: N/A

MSD Lab Sample ID: 360-25552-15 Analysis Batch: 360-51748 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 10 Initial Weight/Volume: 1.0 mL

Date Analyzed: 11/17/2009 0024 Final Weight/Volume: 10 mL

Date Prepared: N/A

% Rec. RPD Analyte MS MSD Limit **RPD Limit** MS Qual MSD Qual Sulfate 75 - 125 104 2 20 106 Chloride 112 111 75 - 125 1 20

Client: Olin Corporation Job Number: 360-25552-1

Method Blank - Batch: 360-51958 Method: 300.0 Preparation: N/A

Lab Sample ID: Analysis Batch: 360-51958 MB 360-51958/3 Instrument ID: No Equipment Assigned Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL Date Analyzed: 11/18/2009 2031 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Result RL RL Analyte Qual Sulfate ND 2.0 2.0 Chloride ND 1.0 1.0

Lab Control Sample - Batch: 360-51958 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-51958/4 Analysis Batch: 360-51958 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: Units: mg/L Initial Weight/Volume: 1.0 1.0 mL

Date Analyzed: 11/18/2009 2046 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual 80.0 85 - 115 Sulfate 81.0 101 40.0 85 - 115 Chloride 41.7 104

Calculations are performed before rounding to avoid round-off errors in calculated results.

No Equipment Assigned

1.0 mL

Instrument ID:

Client: Olin Corporation Job Number: 360-25552-1

Matrix Spike/ Method: 300.0 Matrix Spike Duplicate Recovery Report - Batch: 360-51958 Preparation: N/A

Client Matrix: Water Prep Batch: N/A Lab File ID:

Dilution: 20 Initial Weight/Volume:

11/18/2009 2131 Final Weight/Volume: Date Analyzed: 10 mL

Date Prepared: N/A

Analysis Batch: 360-51958

MSD Lab Sample ID: 360-25552-2 Analysis Batch: 360-51958 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID:

Dilution: 20 Initial Weight/Volume: 1.0 mL

Date Analyzed: 11/18/2009 2147 Final Weight/Volume: 10 mL

Date Prepared: N/A

% Rec. RPD Analyte MS MSD Limit **RPD Limit** MS Qual MSD Qual Sulfate 75 - 125 95 20 95 0 Chloride 119 119 75 - 125 0 20

MS Lab Sample ID:

360-25552-2

Client: Olin Corporation Job Number: 360-25552-1

Method Blank - Batch: 360-51962 Method: 300.0 Preparation: N/A

Lab Sample ID: Analysis Batch: 360-51962 MB 360-51962/3 Instrument ID: No Equipment Assigned Client Matrix: Prep Batch: N/A Lab File ID:

Water N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL Date Analyzed: 11/19/2009 0304 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Result RL RL Analyte Qual Sulfate ND 2.0 2.0 Chloride ND 1.0 1.0

Lab Control Sample - Batch: 360-51962 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-51962/4 Analysis Batch: 360-51962 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: Units: mg/L Initial Weight/Volume: 1.0 1.0 mL

Date Analyzed: 11/19/2009 0319 Final Weight/Volume: 1.0 mL

Analyte Spike Amount Result % Rec. Limit Qual 80.0 85 - 115 Sulfate 83.1 104 40.0 85 - 115 Chloride 42.2 105

Date Prepared:

N/A

1.0 mL

Client: Olin Corporation Job Number: 360-25552-1

Method Blank - Batch: 360-51829 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-51829/1-A Analysis Batch: 360-51839 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: 360-51829 Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume:

Date Prepared:

11/18/2009 1245

11/18/2009 1525 50 mL Date Analyzed: Final Weight/Volume:

Analyte Result Qual RL RL ND Ammonia 0.10 0.10

Lab Control Sample - Batch: 360-51829 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-51829/2-A Analysis Batch: 360-51839 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: 360-51829 Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

11/18/2009 1526 Date Analyzed: Final Weight/Volume: 50 mL 11/18/2009 1245 Date Prepared:

Analyte Spike Amount Result % Rec. Limit Qual Ammonia 85 - 115 10.0 9.59 96

Matrix Spike/ Method: L107-06-1B

Matrix Spike Duplicate Recovery Report - Batch: 360-51829 Preparation: Distill/Ammonia

MS Lab Sample ID: 360-25552-10 Analysis Batch: 360-51839 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: 360-51829 Lab File ID: N/A

Dilution: 10 Initial Weight/Volume: 1.0 mL 11/18/2009 1542 Date Analyzed: Final Weight/Volume: 50 mL

11/18/2009 1245 Date Prepared:

MSD Lab Sample ID: 360-25552-10 Analysis Batch: 360-51839 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: 360-51829 Lab File ID: N/A

Dilution: 10 Initial Weight/Volume: 1.0 mL

11/18/2009 1543 Final Weight/Volume: 50 mL Date Analyzed: Date Prepared: 11/18/2009 1245

% Rec. Analyte MS MSD Limit **RPD RPD Limit** MS Qual MSD Qual Ammonia 130 153 75 - 125 3 20 4 4

Calculations are performed before rounding to avoid round-off errors in calculated results.

**TestAmerica Westfield** Page 79 of 89

1.0 mL

Client: Olin Corporation Job Number: 360-25552-1

Method Blank - Batch: 360-52108 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-52108/1-A Analysis Batch: 360-52155 Instrument ID: No Equipment Assigned

Client Matrix: Prep Batch: 360-52108 Lab File ID: Water N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume:

11/24/2009 1510 Date Analyzed: Final Weight/Volume: 50 mL Date Prepared: 11/24/2009 0906

Analyte Result Qual RL RL ND Ammonia 0.10 0.10

Lab Control Sample - Batch: 360-52108 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-52108/2-A Analysis Batch: 360-52155 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: 360-52108 Lab File ID: N/A Dilution: 1.0

Units: mg/L Initial Weight/Volume: 1.0 mL 11/24/2009 1511 Date Analyzed: Final Weight/Volume: 50 mL

11/24/2009 0906 Date Prepared:

Analyte Spike Amount Result % Rec. Limit Qual Ammonia 97 85 - 115 10.0 9.74

Matrix Spike/ Method: L107-06-1B

Matrix Spike Duplicate Recovery Report - Batch: 360-52108 Preparation: Distill/Ammonia

Analysis Batch: 360-52155 MS Lab Sample ID: 360-25552-15 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: 360-52108 Lab File ID: N/A

Initial Weight/Volume: Dilution: 2.0 1.0 mL Date Analyzed: 11/24/2009 1605 Final Weight/Volume: 50 mL

11/24/2009 0906 Date Prepared:

MSD Lab Sample ID: 360-25552-15 Analysis Batch: 360-52155 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: 360-52108 Lab File ID: N/A

Dilution: 2.0 Initial Weight/Volume: 1.0 mL

11/24/2009 1608 Final Weight/Volume: 50 mL Date Analyzed:

Date Prepared: 11/24/2009 0906

% Rec. Analyte MS MSD Limit **RPD RPD Limit** MS Qual MSD Qual

Ammonia 116 118 75 - 125 1 20

Client: Olin Corporation Job Number: 360-25552-1

Method Blank - Batch: 360-52128 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-52128/1-A Analysis Batch: 360-52157 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: 360-52128 Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 11/24/2009 1533 Final Weight/Volume: 50 mL

Date Prepared: 11/24/2009 1333

 Analyte
 Result
 Qual
 RL
 RL

 Ammonia
 ND
 0.10
 0.10

Lab Control Sample - Batch: 360-52128 Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-52128/2-A Analysis Batch: 360-52157 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: 360-52128 Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 11/24/2009 1534 Final Weight/Volume: 50 mL

Date Prepared: 11/24/2009 1333

Analyte Spike Amount Result % Rec. Limit Qual
Ammonia 10.0 10.3 103 85 - 115

RL

Client: Olin Corporation Job Number: 360-25552-1

Method Blank - Batch: 360-51608 Method: SM 2510B

Preparation: N/A

RL

Qual

Lab Sample ID: MB 360-51608/1 Analysis Batch: 360-51608 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A Dilution: 1.0 Units: umhos/cm Initial Weight/Volume:

11/12/2009 1537 Date Analyzed: Final Weight/Volume: 1.0 mL Date Prepared: N/A

Analyte Result Specific Conductance ND 1.0 1.0

Lab Control Sample - Batch: 360-51608 Method: SM 2510B Preparation: N/A

Lab Sample ID: LCS 360-51608/3 Analysis Batch: 360-51608 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: Dilution: 1.0 Units: umhos/cm Initial Weight/Volume:

11/12/2009 1540 Date Analyzed: Final Weight/Volume:

1.0 mL Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual Specific Conductance 1410 1400 85 - 115 99

Client: Olin Corporation Job Number: 360-25552-1

Duplicate - Batch: 360-51608 Method: SM 2510B

Preparation: N/A

Lab Sample ID: 360-25552-10 Analysis Batch: 360-51608 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A
Dilution: 1.0 Units: umhos/cm Initial Weight/Volume:

Date Analyzed: 11/12/2009 1623 Final Weight/Volume: 1.0 mL Date Prepared: N/A

Analyte Sample Result/Qual Result RPD Limit Qual
Specific Conductance 1200 1210 0 20

Duplicate - Batch: 360-51608 Method: SM 2510B Preparation: N/A

Lab Sample ID: 360-25552-15 Analysis Batch: 360-51608 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A
Dilution: 1.0 Units: umhos/cm Initial Weight/Volume:

Date Analyzed: 11/12/2009 1632 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte Sample Result/Qual Result RPD Limit Qual
Specific Conductance 210 206 0 20

Client: Olin Corporation Job Number: 360-25552-1

Method Blank - Batch: 360-51609 Method: SM 2510B

Preparation: N/A

N/A

Lab Sample ID: MB 360-51609/1 Analysis Batch: 360-51609 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: Dilution: 1.0 Units: umhos/cm Initial Weight/Volume:

11/12/2009 1639 Date Analyzed: Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte Result Qual RL RL Specific Conductance ND 1.0 1.0

Lab Control Sample - Batch: 360-51609 Method: SM 2510B Preparation: N/A

Lab Sample ID: LCS 360-51609/2 Analysis Batch: 360-51609 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: Dilution: 1.0 Initial Weight/Volume: Units: umhos/cm

11/12/2009 1641 Date Analyzed: Final Weight/Volume:

1.0 mL Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual 1410 1390 85 - 115 Specific Conductance 98

Method: SM 2510B Duplicate - Batch: 360-51609 Preparation: N/A

Lab Sample ID: 360-25552-20 Analysis Batch: 360-51609 Instrument ID: No Equipment Assigned Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: umhos/cm Initial Weight/Volume:

11/12/2009 1645 Date Analyzed: Final Weight/Volume: 1.0 mL Date Prepared: N/A

RPD Qual Analyte Sample Result/Qual Result Limit Specific Conductance 1200 1240 0 20

### State Accreditation Matrix

	State Accr	editation Mat				
		N. V.	State where	Primary Accredita		
Made al Nessa	Description	New York (NELAC)	Mass	Conn	Florida (NELAC)	North Carolina
Method Name 821-R-02-012	Description  Toxicity, Acute (48-Hour)(list upon request)	(NELAC)	IVIdSS	Conn	(NELAC) NP	North Carolina
SM 4500 CI F	Chlorine, Residual		NP	-	INI	
SM 9215B	Heterotrophic Plate Count (Pour Plate Method)		P			
SM 9215E	Heterotrophic Plate Count (Four Plate Method)		Р			
SM 9221F	E.Coli (Multiple-Tube Fermentation; EC-MUG)		P			
SM 9222B	Coliforms, Total (Membrane Filter)		P			
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP			
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		P			
200.8	Metals (ICP/MS) (list upon request)	NP/P	NP/P	NP/P		
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	NP/P		
6010B	Metals (ICP)(list upon request)	NP/SW		NP/SW		
245.1	Mercury (CVAA)	NP/P	NP	NP/P		
7470A	Mercury (CVAA)	NP		NP		
7471A	Mercury (CVAA)	SW		SW		
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P		
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P		
3010A	Preparation, Total Metals	NP/P		NP/P		
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW		1
3050B	Preparation, Metals	SW		SW		1
504.1	EDB, DBCP and 1,2,3-TCP (GC)		Р	Р		1
608	Organochlorine Pest/PCBs (list upon request)	NP	NP	NP		1
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP		NP		
3546	Microwave Extraction	SW				
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		NP		
3540C	Soxhlet Extraction					
3550B	Ultrasonic Extraction	SW		SW		
600/4-81-045	Polychlorinated Biphenyls (PCBs) (GC)		NP	NP		
8081A	Organochlorine Pesticides (GC)(list upon request)	NP/SW		NP/SW		
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW		
8270C	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW		
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)			NP/SW		
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
524.2	Volatile Org Comp (GC/MS)(list upon request)	Р	Р	Р		
524.2	Trihalomethanes		Р	Р		
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	NP		
5035	Closed System Purge and Trap	SW		SW		
5030B	Purge and Trap	NP		NP		
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW		
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
180.1	Turbidity, Nephelometric		Р	Р		
300	Anions, Ion Chromatography	NP/P	NP/P	NP/P		
410.4	COD	NP	NP	NP		
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW		SW		
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP	NP		
7196A	Chromium, Hexavalent	NP/SW		NP/SW		
9012A	Cyanide, Total and/or Amenable	NP/SW		NP/SW		
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		NP		
9040B	рН	NP		NP		
9045C	pH	SW		SW		
L107041C	Nitrogen, Nitrate	NP	Р	NP/P		
L107-06-1B	Nitrogen Ammonia	NP	NP	NP/P		
L204001A CN	Cyanide, Total		NP/P	NP/P		
L210-001A	Phenolics, Total Recoverable	NP	NP	NP		
SM 2320B	Alkalinity	NP/P	NP/P	NP/P		
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P		
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P		1
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	NP		
SM 3500 CR D	Chromium, Hexavalent	NP		NP		
SM 4500 H+ B	pH	NP/P	NP/P	NP/P		
SM 4500 NO2 B	Nitrogen, Nitrite	NP	Р	NP/P		
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	NP/P		
SM 4500 P E	Phosphorus, Total	NP	NP	NP		
SM 4500 S2 D	Sulfide, Total	NP		NP		
SM 5210B	BOD, 5-Day	NP	NP	NP		
SM 5310B	Organic Carbon, Total (TOC)	NP	NP	NP/P	<u> </u>	1

Not all organic compounds are accreditied under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory

The lab carries additional accreditations with several states. This is listing is subject to change based on the laboratories current certification standing.

### **Login Sample Receipt Check List**

Client: Olin Corporation Job Number: 360-25552-1

Login Number: 25552 List Source: TestAmerica Westfield

Creator: Rinard, Kimberley A

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	5.6 C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified	True	

# TestAmerica Laboratories, Inc. Chain of Custody Form

Test America

\$53 Southampton Road
 Westfield, MA 01085
 (P) 413-572-4000
 (F) 413-572-3707

ment	Relinguished by:	Relinquished by:	chapmon ( ch	00- Gw- 2025	58t.mo.20	mg 56t-mg-20	00-6W-25 GW	oc. Gw - 24 ew	00-0w-765	0c, 6w-26 6w	0 6-6w-105	0c-Gw-2015 &w	OC-GW-425 GW	Sample ID	Sample Type Codes  WW-Wastewater DW-Drinking water SW-Surfacewater  LW-Labwater GW-Groundwater A-Air  LS-Solid / Soil SL-Sludge O-Oil Z-Other	48 hrs	24 hrs	10 Business Day (Std)XX   Rush TAT Requested:	equested Turn Arc	Phone: Fax:	Wilmington, MA 01887	Address: 51 Eames Street	Client: Olin Chemical/MACTEC	
ı	//((( <sup>†</sup> 09	Date:	hris Marzol	CGA	127	Y	CTM	Cas.	Ÿ	CTN	۲	ا ا	מילכב א		vater	5 Day Other	72 hrs   RCRA		Regula			Pro		
	Time: R	Time:	¥.	1111109 / 3	12:45 / 3	12:40 / 3	11/10/09 / 3	10109	11:10 / 3	1110104 / 3 9:50 / 3	q:45 / 3	19109 / 3	10:55 / 3	Collected.  Grab Comp. # Containe	irs	With the second	MCP GW1/S1	Drinking Water	Regulatory Classification	Contact: Da	Work ID: G	Project Manager: P.	Project #: 61	
TestAmerica-We	Recejvéd bý: 0 M	Received by:	Signature:	P	P 1	7 -	7 1 1	7	7 1 7		7	-7		Plastic(P) or NaHSO4/M HNO3 to p H2SO4 to HCI to pH NaOH to p	H <2 Preserva	MCP		ater	-	Contact: David Chapman	Groundwater	P. Thompson	6107-09-0016.04	
ca-Westfield		2000 00	100	- 1 5 9	- \ \ \ \	>		- 1	- 1	-	- 1	- 2 1		NAOH/ZN/ None / 4° Ammonia- Chloride, S	C Nitrogen Sulfate	MCP QA/QC Rpt XX	MWRA Smart Rpt	DEP Form(s)	Special Report Format					
eld	Date:	celuto 9	1/1		•	Ì	<u> </u>					•	•	Diss. Al/Cr Groundwa 8260B TM 8270C ND VPH (MAV Dissolved F	ter metals Ps only PA/BEHP /PH)		Use comments section to further define.	8000-series for haz/solid waste	500-series for drinking water	and analytes in comments section. For example:	Check analysis and specify method	Shaded areas for office use Analysis Requested	J6b#	1560 006
<del></del>	Time:											A		pH by SM4 Other Other Other			further define.	olid waste	ē.		ecify method	r office use	Quote#	] `
By Date () wo	Preservation/pH checked	Temp @ receipt: 5,6°1 °C	Cooler (V) N Samples Iced (V) N							Pag	Specific ConductivitySM 2510B <sub>e</sub>	Ammonia NitrogenLac 107-06-PB	Dissolved metals are field filtered. 8							MCP case narrative	(Special Instructions)	Comments	T C#	1221

# TestAmerica Laboratories, Inc. Chain of Custody Form

# Test/merica

•53 Southampton Road Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707

By: 1/4 Date: 11/11/09		eld	TestAmerica-Westfield	ica-V	Amer.	Test/		,			Method of shipment:
Preservation/pH checked	715	11/11/09		Port	1000	Received by:	4	7 Time:	((((09)	$\sim$	Relinquished by:
Temp @ receipt: Sub'L °C	085	schilos		2	in the second	Received by		18:	Date:		Relinquished by:
Cooler (V / N Samples Iced (V / N	Time:		Ø		W.		_	Mazzelini	77.5	0	Sampled by (print):  Pavid Chapman
7			7	-	11	38	-	50:b	٤	8	SUATE - M9-20
1		,	7	-	-	7	-	501b	Š	9	0c-Gw-34 P Dup
		1	7	-	-	3 P	1	111150	کمح	ę.	06.6w.202D
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		\	2	_	-	W 7	1	10:20	274	3	00-6w-CA-1
<u>.</u>		3	1	-	1	3 0	_	9:05	مح	Gw.	945 - MD-20
Pag		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	1	-	-	3 P	1	40:4 40 11 11	CTT	4	00-6W-343R
25101			1	-	7	3		15:05	brc	\$? *	oc- P2-18F
Ammonia NitrogenLac 107-06-		\	\ \ \	42	٣	7		13:50	7	6	OC- PZ-17 PR
Analysis			1	۲	4	2 0		50:51	۲	8	OC-92-16ER
Dissolved metals are field filtered.	Dissolved	Groundwa 8260B TN	Ammonia Chloride, Specific C	NaOH to p NAOH/ZN None / 4	HNO3 to pHCI to pH	Plastic(P) o NaHSO4/I	Grab Comp. # Containe		Sampler's Initials	Sample Type	Sample ID
	Fe by 6010B 14500H+B	PA/BEHP	Sulfate condutivity	°C	pH <2 eserva	r Glass(G) MeOH			er	facewat	Sample Type Codes  WW-Wastewater DW-Drinking water SW-Surfacewater  W-Labwater GW-Groundwater A-Air  S-Solid / Soil SL-Sludge O-Oil Z-Other
			Rpt XX	MCP QA/QC R	MCP			Other		5 Day	
	n to further define.	Use comments section to further define		<b>MWRA Smart Rpt</b>	- MWF	V1/S1 —	MCP GW1/S1			72 hrs	
	ste water az/solid waste	600-series for waste water 8000-series for haz/solid waste		DEP Form(s)	DEP	ater	Drinking Water	NPDES Drinking W		quested	Requested Furn Around Time  10 Rusiness Day (Std) XX   Rush TAT Requested:
MCF case namanve		For example: 500-series for drinking water		enort Fo	oman Special Report Forma	d Cha	act: D	Cont			Phone: Fax:
		and analytes in comments section.			water	Work ID: Groundwater	ē	Work			Wilmington, MA 01887
Comments (Special Instructions)	Analysis Requested	Analysis			ח	Thompso	ger. P	Project Manager: P. Thompson			Address: 51 Eames Street
1 <b>(</b>	shaded areas for office lise	2552-072 Hope			16.04	Project #: 6107-09-0016.04	# 6	Projec			Client: Olin Chemical/MACTEC

# TestAmerica Laboratories, Inc. Chain of Custody Form

# Test America

◆53 Southampton Road Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707

By: 164 Date: 11/11/09	ield	TestAmerica-Westfield			Method of shiptment:
Preservation/pH checked	2011	Recoved by: O Can	60 (7(5)	// (ct (00	Relinquished by:
Temp @ receipt:	30)	muy Lay		1 1 / 1 / Cq	Relinquished by:  David Chapman
Cooler ?(Y/I N Samples iced*X/I N	Date: Time:	Mazzelyhi China	in ris	Chapter /	Sampled by (print): Power Char
5	1011	Signature:		5	
	  @ 				
	<b>D</b>				
1			1111/05	_	
. <b>.</b>					
Pag		1 1 1 2 2 8	32:11	CW CTT	00-GW-2525 MSD
2510		3P	11:28	CT. CT.	oc. 6w-2025 MS
Ammonia NitrogenLac 107-06-88 Chloride/sulfateEPA 300		3 9 1 1 7 7	11:28	CT?	Oc. 6m - 2025 pup
Analysis 8		3 7 - 1	9:05	2 A C	00-0W-340MSD
Dissolved metals are field filtered.	Grounds 8260B 1 8270C I VPH (M Dissolve	# Contain Plastic(P) NaHSO4 HNO3 to H2SO4 t HCI to pl NaOH to NAOH/Z None / Ammoni Chloride	Time Collected Grab Comp.	Sample Type Sampler's Initials	Sample ID
	Cr by 6010E water metals MPs only NDPA/BEHF AVPH) d Fe by 6010E M4500H+B	or Glass(G)  /MeOH pH <2 o pH <2 o pH >12 NAC 4° C a-Nitrogen , Sulfate  Condutivity			Sample Type Codes  NW-Wastewater DW-Drinking water SW-Surfacewater  W-Labwater GW-Groundwater A-Air  S-Solid / Soil SL-Sludge O-Oil Z-Other
		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Other	5 Day	48 hrs
	Ose continents section to talable some	MCP GW1/S1 MCP GA/GC Ret XX			24 hrs
	8000-series for haz/solid waste	ater DEP Form(s)	NPDES Drinkir		Dequested Tarris Const. TAT Requested:
	500-series for drinking water	tion / Special Report Format	Regulatory Classification		Phone: rax.
MCP case narrative	For example:	Contact: David Chapman	Contact		
	Check analysis and specify method	Work ID: Groundwater	Work ID:		Wilmington, MA 01887
(Special Instructions)	Analysis Requested	P. Thompson	Project Manager: P. Thompson		Address: 51 Eames Street
•	Shaded areas for office use	Project #: 6107-09-0016.04	Project #: 6		Client: Olin Chemical/MACTEC
70	Job#UC COND Quote#				

Version 1.2, Nov 2002

### OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

Reviewer/Date	Chris Ricardi	3/17/10
Sr. Review/Date		//
Lab Report #	25553	
Project # (e)	71000/6	2

	AI, Cr, Fe only			\250 £		
1.0	Laboratory Deliverable Requirements					
	1.1 Laboratory Information: Was all of the following provided in the laboratory report?  Check items received.  Z Name of Laboratory		No [] ble identifica	N/A [] tion – Field ar	Comments:	No Qua
	Cheft Intornation.				,	
ACTIO	ON: If no, contact lab for submission of missing or illegible information.					
	1.2 Laboratory Report Certification Statement	Yes [ ]	No []	N/A []	Comments:	
Does tl	ne laboratory report include a completed Analytical Report Certification in the required	format?				
ACTIO	N: If no, contact lab for submission of missing certification or certification with correct	/	/			
	1.3 Laboratory Case Narrative:	Yes [V]	No [_]	N/A []	Comments:	
	☐ Narrative serves as an exception report for the project and method QA/QC perform the	ormance.	₫ Na	rrative includ	es an explanatio	n of each discrepancy
				Certifica	tion Statement.	
ACTIO	N: If no, contact lab for submission of missing or illegible information.					
	1.4 Chain of Custody (COC) copy present with all documentation completed	Yes []	No []	N/A []	Comments:	
	NOTE: Olin receives and maintains the original COC.					

ACTION: If no, contact lab for submission of copy of completed COC.

			/			
1.5	Sample R	Receipt Information (Cooler Receipt Form present?):	Yes [ ]	No [_]	N/A [_]	Comments:
	ere each of o the labora	the following tasks completed and recorded upon receipt of the tory?	e sample(s)			
☑ Sample to ☑ Containe	emperature r type noted	confirmed: must be $1^{\circ} - 10^{\circ}$ C. (If samples were sent by courier a sample condition observed $\square$ pH verified (where applicable)	nd delivered on the same	day as colle	ection, tempera	ature requirement does not apply).
ACTION:	If no, conta	ct lab for submission of missing or incomplete documentation.	/			
	1.5.1	Were all samples delivered to the laboratory without breakage?	Yes [_]	No []	N/A [_]	Comments:
	1.5.2	Does the Cooler Receipt Form or Lab Narrative indicate oth with sample receipt, condition of the samples, analytical probler circumstances affecting the quality of the data?	er problems ns or special Yes []	No [_]	N/A [_]	Comments:
1.6		Results Section: Was each of the following requirements sur report for each sample?	plied in the Yes [_]	No []	N/A []	Comments:
☐ Field II ☐ Clean-u, ☑ Matrix	O and Lab I p method	D Date and time collected Avalyst Initia  Analysis method  Target analytes and concentrations	ls Dilution method Date of Units (soils mus	n Factor preparation/ st be reporte	/extraction/dige d in dry weigh	moisture or solids
		act lab for submission of missing or incomplete information.	/			
1.7 lab	QA/QC ooratory rep	<b>Information:</b> Was each of the following information support for each sample batch?	olied in the Yes [ ]	No []	N/A []	Comments:

6010.doc

✓ Method blank results ✓ LCS recoveries ✓ MS/MSD recoveries and RPDs ☐ Laboratory duplicate results (where applicable)	
ACTION: If no, contact lab for submission of missing or incomplete information.  See LCSD / MSD	
2.0 Holding Times	
Have any technical holding times, determined from date of collection to date of analysis, been Yes No	nments:
NOTE: List samples that exceed hold time with # of days exceeded on checklist	
ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). If grossly exceeded (2X holding time) reject (R) all non-detect results.	
3.0 <u>Laboratory Method</u>	
3.1 Was the correct laboratory method used?  Yes No N/A Cor	nments:
Water Digestion Soil Digestion Metals  3005A or 3010A or 3020A 3050B 6010B or 200.7	
<b>ACTION</b> : If no, contact laboratory to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change and to request variance.	
3.2 Are the practical quantitation limits the same as those specified by the Yes No NA Cor	nments:
3.2 Are the practical quantitation limits the same as those specified by the Yes [ ] No [ ] N/A [ ] Cor    SOW  QAPP  Lab  MADEP	aments:
NOTE: Verify that the reported metals match the target list specified on the COC.	
6010.doc	

	: If no, evaluate variation with respect to sample matrix, preparation, dilution, etc. If sample PQL is indeterminate, contact lab for explanation.	/	/		
3.3	Are results present for each sample in the SDG?	Yes [_]	No []	N/A []	Comments:
ACTION: If	no, check Request for Analysis to verify if method was ordered and COC to verify that i	t was sent, a	nd contact la	ab for resubmi	ission of the mis
3.4	If dilutions were required, were dilution factors reported?	Yes [ ]	No []	N/A []	Comments:
ACTION: If	no, contact the lab for submission.				
4.0 <u>Me</u>	thod Blanks		/		
4.1	Is the Method Blank Summary present?	Yes [_/	No []	N/A []	Comments:
ACTION	: If no, call the laboratory for submission of missing data.	,	/		
4.2	Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?	Yes 🗾	No [_]	N/A []	Comments:
	: If no, contact laboratory for justification. Consult senior chemist for action larrate non-compliance.			,	
4.3	Is the method blank less than the PQLs for all target elements?	Yes [ ]	No I	/ N/A[]	Comments:
NOTE: M samples	MADEP requires the method blank to be matrix matched and digested with the	/	/	1004/3 (	
4.4 the	Do any method blanks have positive results for metals? Qualify data according to following:	Yes [	No []	N/A []	Comments:
6010.doc	Lab 4 of 10	B	quals	removi	ed

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the
PQL or the concentration reported if greater than the PQL.

If the sample concentration is  $> 5 \times$  blank value, no qualification is needed.

**ACTION:** For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = 5x the blank value) and the associated samples and qualifiers.

= 53	the blank	value) and the associated samples and qualifiers.			
5.0	Labor	ratory Control Standard	1		
	5.1	Was a laboratory control standard run with each analytical batch of 20 samples or less?	Yes 🔼	No [_] N/A [_]	Comments:
A	CTION:	If target, second source LCS is required by MADEP.  Call laboratory for LCS form submittal. If data are not available, use judgement to evaluate data accuracy associated with that batch.	,	,	
	5.2	Is a LCS Summary Form present?	Yes [_	No	Comments:
A	CTION: I	f no, contact lab for resubmission of missing data.			
	5.3	Is the recovery of any analyte outside of MADEP control limits?  MADEP	Yes []	No N/A	Comments:
	Sampl	e Type			
	Water Soil	80-120 within Lab generated limits			
Δ		If recovery is above the upper limit, qualify all positive sample results			
		atch as (J). If recovery is below the lower limit, qualify all positive and			
		results within the batch as (J). If LCS recovery is <30%, positive and non-			
de	etect results	s are rejected (R).			

Comments:

### Matrix Spikes 6.0

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

Were project-specific MS/MSDs collected? List project samples that were 6.1 spiked.

ACTION: If no, contact senior chemist to see if any were specified.

Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present? 6.2

NOTE: A full target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

Were matrix spikes analyzed as indicated on the COC and project 6.3 schedule?

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

Are any metal spike recoveries outside of the QC limits? 6.4

	MADEP	QAPP		
Sample Type	% Rec	% Rec	Method	
Water	75-125	N/A	6010B	
Water	N/A	70-130	200.7	
Soil	75-125	75-125	6010B	

**NOTE**:  $%R = (SSR-SR) \times 100\%$ SA

Where: SSR = Spiked sample result SR = Sample result

SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

/			
Yes 💹	No []	N/A []	Comments:
Yes 💹	No []	N/A [_]	Comments:
Yes [V]	No []	N/A []	Comments:

AI, Fe > 4x spila. No evaluation Possible.

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags. ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J). Are any RPDs for MS/MSD recoveries outside of the QC limits? 6.5 NOTE: RPD = S-D x 100% Where: S = MS sample result D = MSD sample result NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied. ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J). **Laboratory Duplicate** 7.0 7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Yes [\_] No [\_] Duplicate Sample Form present? NOTE: MADEP refers to this sample as a "matrix duplicate". ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance. 7.2 Is the RPD between the result for the laboratory duplicate sample and the

6010.doc

result for the parent sample outside of the QA/QC limits?

MADEP Laboratory Duplicate Sample RPD Criteria:	QAPP RPD
For aqueous results > $5 \times RL$ , RPD must be $\pm 20\%$	20
For aqueous results < 5× RL, RPD must be ≤ RL	20
For soil/sediment results > $5 \times RL$ , RPD must be $\pm 35\%$	20
For soil/sediment results $< 5 \times RL$ , RPD must be $\le 2 \times RL$	20

**ACTION**: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

### 8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

- 8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.
- **8.2** Do any rinsate blanks have positive results?

NOTE: MADEP does not require the collection of rinsate blanks.

**ACTION:** Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is  $< 5 \times$  blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is  $> 5 \times$  blank value, no qualification is needed.

### 9.0 Field Duplicates

**9.1** Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.



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	9.2 Were field duplicates collected per the required frequency?	Yes 📋	No [_]	N/A []	Comments:
SO	W □ QAPP (1 per 10) ☑ MADEP Option 1 (1 per 20) □ MADEP Option 3 (1 per 10) □	/	/		
	9.3 Was the RPD $\leq$ 50% for soils or waters? Calculate the RPD for all results and attach to this review.	Yes [V	No [_]	N/A [_]	Comments:
ACTIO	<b>DN</b> : RPD must be ≤50% for soil and water. Qualify data (J) for both sample results i	if the RPD e	exceeds 50°	%. De	
10.0	Special QA/QC			/	
	10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal.	Yes [_]	No [_]	N/A	Comments:

**ACTION:** If results for both total and dissolved are  $\geq 5x$  the PQL and the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL and the difference exceeds 2x the PQL, flag both results as estimated (J)

10.0	Application of Validation Qualifiers		/	/	
	Was any of the data qualified?	Yes [_]	No [1]	N/A []	Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

### REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (OA/OC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

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		Sample		Dup		RPD
OC-SD-SD-SD1-0.0/0.5	Percent Moisture	44		42		5
OC-SD-SD-SD1-0.0/0.5	Percent Solids	56		58		-4
OC-SD-SD-SD1-0.0/0.5	Aluminum	9200		11000		-18
OC-SD-SD-SD1-0.0/0.5	Chromium	21		22		-5
OC-SD-SD-SD1-0.0/0.5	Iron	11000	В	18000	В	-48





### ANALYTICAL REPORT

Job Number: 360-25553-1

Job Description: Olin Chemical Superfund Site

For:

Olin Corporation 3855 North Ocoee Street Suite 200

Cleveland, TN 37312-4441

Attention: Mr. Steven Morrow

CHECKED FOR COMPLETENESS

Joseph a. Cheur J.

Joe Chimi Report Production Representative 11/23/2009 11:12 AM

Designee for Becky C Mason Project Manager II becky.mason@testamericainc.com 11/23/2009

cc: Mr. Peter Thompson

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY ELAP 10843, North Carolina 647, NELAP PA 68-04386. Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002.



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Laborator	y Name:	TestAmeric	ca Westfield		Proje	ect #:	360-	25553	-1
Project Lo	cation:				MADEP F	RTN <sup>1</sup> :			
		cations for the f	ollowing data set	t:[list Laborator	y Sample ID Nun	nber(s)]			
360-2555	3-(1-6)								
Sample M	atrices:	Groundwater	Soil/Se	ediment	Drinking Water	Othe	r:		
MCP SW	<b>/-846</b>	8260B( )	8151A ( )	8330 ( )	6010B (x)	7470A/1A (	( )	Othe	r ( )
Methods	Used	8270C( )	8081A ( )	VPH()	6020 ()	9014M <sup>2</sup> /90	. ,		
•	ed in MADEP	8082 ( )	8021B ( )	EPH()	` '	7196A ( )			
Compend			e Tracking Numb	, , ,		hla Ovanial	- (DAC)	\ \ \ \ a + b =	_1
•	Methods. that apply)			•	iologically Availa vidual method ar	-	e (PAC)	) ivietno	a
	,						v" ototi	10	
					for "Presumptiv	e Certaint		15	1
Α			y the laboratory in the laboratory in the laboratory in the laboratory documents.				Yes √		No <sup>1</sup>
	Were all QA/C	C procedures	required for the s	specified analy	ical method(s)		Yes		No <sup>1</sup>
В		•	d, including the r		, ,		$\sqrt{}$		
	discuss in a na	arrative QC dat	a that did not me	eet appropriate	performance				
	standards or g	guidelines?							
	Does the analy	ytical data inclu	ıded in this repor	rt meet all the r	equirements		Yes	N/A	No <sup>1</sup>
С	1	-	•		(b), (c) and (d) of	:			
	the MADEP do	ocument CAM	VII A, " Quality A	ssurance and	Quality				
	Control Guidel	lines for the Ac	quisition and Re	porting of Analy	rtical Data"?				
	VPH and EPH	l methods only	y: Was the VPH	or EPH Metho	d conducted with	out	Yes	N/A	No <sup>1</sup>
D	significant mod	difications (see	Section 11.3 of	respective Met	hods)?			$\sqrt{}$	
	A respons	se to question	s E and F belov	v is required f	or "Presumptive	Certainty	" status	S	
E	•		andards and reco	ommendations	for the		Yes		No <sup>1</sup>
		nods achieved?				-			<b>√</b>
F		-	st compounds/el	ements for the	specified		Yes	N/A	No <sup>1</sup>
	method(s) rep	orted?							V
	<sup>1</sup> All Negative r	esnonses mus	t he addressed i	n an attached l	Environmental La	horatory ca	ase narr	ative	
the und					hat, based upor			auvo.	
	_	-	-		erial contained i		Jilai		
	-		_		te and complete				
-	-	,							
	Signature:	St	Hoston		Position:	Laborato	ry Dire	ctor	
	Printed Name:	Steven C. Ha	artmann		Date:		11/23/09	9 11:08	
he certification	form has been electronica	ally signed and approved			CAM VII	A, Rev 3.2		Aį	oril-04
	2	MADEP MA014	NELAP FL E87912 TOX		TestAmerica Westfield				
A COLUMN TWO IS NOT A CO.	morica	NY DOH 10843	NELAP NJ MA008 TOX		53 Southampton Rd,				
Test <sub>A</sub>	4 HEHCU								
	ENVIRONMENTAL TESTING	RI DOH 57 CT DPH 0494	NELAP NY 10843 NH DES 253901-A	STED IN ACCORDANCE	Westfield, MA 01085 Tel:(413)572-4000				

### **CASE NARRATIVE**

**Client: Olin Corporation** 

**Project: Olin Chemical Superfund Site** 

Report Number: 360-25553-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes or interferences which exceed the calibration range of the instrument.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

### **RECEIPT**

The samples were received on 11/11/2009; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 5.6 C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

MCP regulatory standard criteria were not specified for this report. Therefore, method reporting limits (RLs) were not assessed against any MCP standards as it may pertain to Question "E" on the Presumptive Certainty Certification Form (MADEP reference: WSC-CAM-AN-093008 - WSC-CAM Analytical Notes).

### **TOTAL METALS**

Samples 360-25553-1 through 360-25553-6 were analyzed for total metals in accordance with EPA SW-846 Method 6010B. The samples were prepared and analyzed on 11/12/2009.

Iron was detected in method blank MB 360-51522/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged "J". If the associated sample reported a result above the MDL and/or RL, the result has been "B" flagged. Refer to the QC report for details.

Aluminum and Iron failed the recovery criteria low for the MS and MSD of sample 360-25553-6 in batch 360-51594. The presence of the '4' qualifier in the report indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. The associated LCS and LCSD recovered within control limits. Refer to the QC report for details.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No other difficulties were encountered during the metals analyses.

All other quality control parameters were within the acceptance limits.

### PERCENT SOLIDS

Samples 360-25553-1 through 360-25553-6 were analyzed for percent solids in accordance with EPA Method 160.3 Modified. The samples were analyzed on 11/12/2009.

No difficulties were encountered during the % solids analyses.

All quality control parameters were within the acceptance limits.

### **EXECUTIVE SUMMARY - Detections**

Client: Olin Corporation

Job Number: 360-25553-1

Lab Sample ID Analyte	Client Sample ID	Result / Qu	alifier	Reporting Limit	Units	Method	-
360-25553-1	OC-SD-SD-SD1-0.0/0.5						
Aluminum		9200	/	5.8	mg/Kg	6010B	
Chromium		21	0	1.2	mg/Kg	6010B	
Iron		11000	В	12	mg/Kg	6010B	
Percent Moisture		44		1.0	%	Moisture	
Percent Solids		56		1.0	%	Moisture	
360-25553-2	OC-SD-SD-SD2-0.0/0.5		/				
Aluminum		11000	0/	4.7	mg/Kg	6010B	
Chromium		77	4	0.94	mg/Kg	6010B	
Iron		17000	В	9.4	mg/Kg	6010B	
Percent Moisture		35		1.0	%	Moisture	
Percent Solids		65		1.0	%	Moisture	
360-25553-3	OC-SD-SD-SD3-0.0/0.5		/				
Aluminum		9900		4.7	mg/Kg	6010B	
Chromium		20	9	0.93	mg/Kg	6010B	
Iron		14000	В	9.3	mg/Kg	6010B	
Percent Moisture		36		1.0	%	Moisture	
Percent Solids		64		1.0	%	Moisture	
360-25553-4	OC-SD-SD-SD5-0.0/0.5		/				
	00-30-303-0.000.3		$\sim$				
Aluminum		13000	9	4.0	mg/Kg	6010B	
Chromium Iron		320 18000		0.81 8.1	mg/Kg mg/Kg	6010B 6010B	
Percent Moisture		33	В	1.0	mg/Kg %	Moisture	
Percent Solids		67		1.0	%	Moisture	
reicent solids		O1	/	1.0	.70	Wolstufe	
360-25553-5	OC-SD-SD-SD4-0.0/0.5						
Aluminum		12000	OV	5.0	mg/Kg	6010B	
Chromium		25	. 7	1.0	mg/Kg	6010B	
Iron		15000	В	10	mg/Kg	6010B	
Percent Moisture		41		1.0	%	Moisture	
Percent Solids		59		1.0	%	Moisture	

### **EXECUTIVE SUMMARY - Detections**

Client: Olin Corporation

Job Number: 360-25553-1

Lab Sample ID Analyte	Client Sample ID	Result / Qu	ualifier	Reporting Limit	Units	Method	
360-25553-6	OC-SD-SD-SD1-0.0/0	.5 DUP	/				
Aluminum		11000		4.5	mg/Kg	6010B	
Chromium		22	y	0.90	mg/Kg	6010B	
Iron		18000	В	9.0	mg/Kg	6010B	
Percent Moisture		42		1.0	%	Moisture	
Percent Solids		58		1.0	%	Moisture	

### **METHOD SUMMARY**

Client: Olin Corporation Job Number: 360-25553-1

Description	Lab Location	Method	Preparation Method
Matrix Solid			
Metals (ICP)	TAL WFD	SW846 6010B	
Preparation, Metals	TAL WFD		SW846 3050B
Percent Moisture	TAL WFD	EPA Moisture	

### Lab References:

TAL WFD = TestAmerica Westfield

### **Method References:**

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

### METHOD / ANALYST SUMMARY

Client: Olin Corporation Job Number: 360-25553-1

Method	Analyst	Analyst ID
SW846 6010B	Smith, Tim J	TJS
EPA Moisture	Nasiatka, Ellen M	EMN

### **SAMPLE SUMMARY**

Client: Olin Corporation Job Number: 360-25553-1

			Date/Time	Date/Time
Lab Sample ID	Client Sample ID	Client Matrix	Sampled	Received
360-25553-1	OC-SD-SD-SD1-0.0/0.5	Solid	11/11/2009 1400	11/11/2009 1715
360-25553-2	OC-SD-SD-SD2-0.0/0.5	Solid	11/11/2009 1425	11/11/2009 1715
360-25553-3	OC-SD-SD-SD3-0.0/0.5	Solid	11/11/2009 1435	11/11/2009 1715
360-25553-4	OC-SD-SD-SD5-0.0/0.5	Solid	11/11/2009 1445	11/11/2009 1715
360-25553-5	OC-SD-SD-SD4-0.0/0.5	Solid	11/11/2009 1500	11/11/2009 1715
360-25553-6	OC-SD-SD-SD1-0.0/0.5 DUP	Solid	11/11/2009 1400	11/11/2009 1715
360-25553-6MS	OC-SD-SD-SD1-0.0/0.5 MS	Solid	11/11/2009 1400	11/11/2009 1715
360-25553-6MSD	OC-SD-SD-SD1-0.0/0.5 MSD	Solid	11/11/2009 1400	11/11/2009 1715

### **SAMPLE RESULTS**

Olin Corporation 3855 North Ocoee Street Suite 200

Cleveland, TN 37312-4441

 Client Sample ID:
 OC-SD-SD-SD1-0.0/0.5
 Date Sampled:
 11/11/2009 1400

 Lab Sample ID:
 360-25553-1
 Date Received:
 11/11/2009 1715

Client Matrix: Solid
Percent Solids: 56

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: 6010B		Date Ana	alyzed:	11/12/2009 1439	
Prep Method: 3050B		Date Pre	pared:	11/12/2009 0801	
Aluminum	9200	mg/Kg	1.5	5.8	1.0
Chromium	21	mg/Kg	0.15	1.2	1.0
Iron	11000 B	mg/Kg	1.8	12	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

 Client Sample ID:
 OC-SD-SD-SD1-0.0/0.5
 Date Sampled:
 11/11/2009 1400

 Lab Sample ID:
 360-25553-1
 Date Received:
 11/11/2009 1715

Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: Moisture		Date A	Analyzed:	11/12/2009 1452	
Percent Moisture	44	%	1.0	1.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200

Cleveland, TN 37312-4441

Client Sample ID: OC-SD-SD2-0.0/0.5 Date Sampled: 11/11/2009 1425

**Lab Sample ID:** 360-25553-2 Date Received: 11/11/2009 1715

Client Matrix: Solid
Percent Solids: 66

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: 6010B		Date Ana	lyzed:	11/12/2009 1442	
Prep Method: 3050B		Date Prep	oared:	11/12/2009 0801	
Aluminum	11000	mg/Kg	1.2	4.7	1.0
Chromium	77	mg/Kg	0.13	0.94	1.0
Iron	17000 B	mg/Kg	1.5	9.4	1.0

Olin Corporation 3855 North Ocoee Street Suite 200

Cleveland, TN 37312-4441

 Client Sample ID:
 OC-SD-SD-SD2-0.0/0.5
 Date Sampled:
 11/11/2009 1425

 Lab Sample ID:
 360-25553-2
 Date Received:
 11/11/2009 1715

Lab Sample ID:360-25553-2Date Received:11/11/200Client Matrix:Solid

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: Moisture		Date A	Analyzed:	11/12/2009 1452	
Percent Moisture	35	%	1.0	1.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200

Cleveland, TN 37312-4441

Client Sample ID: OC-SD-SD3-0.0/0.5 Date Sampled: 11/11/2009 1435

**Lab Sample ID:** 360-25553-3 Date Received: 11/11/2009 1715

Client Matrix: Solid
Percent Solids: 64

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: 6010B		Date Analyz	ed:	11/12/2009 1445	
Prep Method: 3050B		Date Prepar	ed:	11/12/2009 0801	
Aluminum	9900	mg/Kg	1.2	4.7	1.0
Chromium	20	mg/Kg	0.12	0.93	1.0
Iron	14000 B	mg/Kg	1.5	9.3	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

 Client Sample ID:
 OC-SD-SD-SD3-0.0/0.5
 Date Sampled:
 11/11/2009
 1435

 Lab Sample ID:
 360-25553-3
 Date Received:
 11/11/2009
 1715

Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: Moisture		Date A	Analyzed:	11/12/2009 1452	
Percent Moisture	36	%	1.0	1.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

 Client Sample ID:
 OC-SD-SD-SD5-0.0/0.5
 Date Sampled:
 11/11/2009 1445

 Lab Sample ID:
 360-25553-4
 Date Received:
 11/11/2009 1715

Client Matrix: Solid
Percent Solids: 67

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: 6010B		Date An	alyzed:	11/12/2009 1448	
Prep Method: 3050B		Date Pre	epared:	11/12/2009 0801	
Aluminum	13000	mg/Kg	1.0	4.0	1.0
Chromium	320	mg/Kg	0.11	0.81	1.0
Iron	18000 B	mg/Kg	1.3	8.1	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

 Client Sample ID:
 OC-SD-SD-SD5-0.0/0.5
 Date Sampled:
 11/11/2009 1445

 Lab Sample ID:
 360-25553-4
 Date Received:
 11/11/2009 1715

Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: Moisture		Date /	Analyzed:	11/12/2009 1452	
Percent Moisture	33	%	1.0	1.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200

Cleveland, TN 37312-4441

 Client Sample ID:
 OC-SD-SD-SD4-0.0/0.5
 Date Sampled:
 11/11/2009 1500

 Lab Sample ID:
 360-25553-5
 Date Received:
 11/11/2009 1715

 Lab Sample ID:
 360-25553-5
 Date Received:
 11/11/2009

 Client Matrix:
 Solid

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: 6010B		Date Ana	ılyzed:	11/12/2009 1451	
Prep Method: 3050B		Date Pre	pared:	11/12/2009 0801	
Aluminum	12000	mg/Kg	1.3	5.0	1.0
Chromium	25	mg/Kg	0.13	1.0	1.0
Iron	15000 B	ma/Ka	1.6	10	1.0

Percent Solids: 59

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

 Client Sample ID:
 OC-SD-SD-SD4-0.0/0.5
 Date Sampled:
 11/11/2009 1500

 Lab Sample ID:
 360-25553-5
 Date Received:
 11/11/2009 1715

Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: Moisture		Date A	Analyzed:	11/12/2009 1452	
Percent Moisture	41	%	1.0	1.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

 Client Sample ID:
 OC-SD-SD-SD1-0.0/0.5 DUP
 Date Sampled:
 11/11/2009 1400

 Lab Sample ID:
 360-25553-6
 Date Received:
 11/11/2009 1715

Client Matrix: Solid
Percent Solids: 58

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: 6010B		Date Analyz	zed:	11/12/2009 1419	
Prep Method: 3050B		Date Prepar	red:	11/12/2009 0801	
Aluminum	11000	mg/Kg	1.2	4.5	1.0
Chromium	22	mg/Kg	0.12	0.90	1.0
Iron	18000 B	mg/Kg	1.4	9.0	1.0

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

 Client Sample ID:
 OC-SD-SD-SD1-0.0/0.5 DUP
 Date Sampled:
 11/11/2009 1400

 Lab Sample ID:
 360-25553-6
 Date Received:
 11/11/2009 1715

Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: Moisture		Date A	Analyzed:	11/12/2009 1452	
Percent Moisture	42	%	1.0	1.0	1.0

#### **DATA REPORTING QUALIFIERS**

Client: Olin Corporation Job Number: 360-25553-1

Lab Section	Qualifier	Description
Metals		
	В	Compound was found in the blank and sample.
	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### **QUALITY CONTROL RESULTS**

Client: Olin Corporation Job Number: 360-25553-1

#### **QC Association Summary**

		Report			
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 360-51522					
LCS 360-51522/2-A	Lab Control Sample	Т	Solid	3050B	
LCSD 360-51522/3-A	Lab Control Sample Duplicate	Т	Solid	3050B	
MB 360-51522/1-A	Method Blank	Т	Solid	3050B	
360-25553-1	OC-SD-SD1-0.0/0.5	Т	Solid	3050B	
360-25553-2	OC-SD-SD-SD2-0.0/0.5	Т	Solid	3050B	
360-25553-3	OC-SD-SD3-0.0/0.5	Т	Solid	3050B	
360-25553-4	OC-SD-SD-SD5-0.0/0.5	Т	Solid	3050B	
360-25553-5	OC-SD-SD-SD4-0.0/0.5	Т	Solid	3050B	
360-25553-6	OC-SD-SD-SD1-0.0/0.5 DUP	Т	Solid	3050B	
360-25553-6MS	Matrix Spike	Т	Solid	3050B	
360-25553-6MSD	Matrix Spike Duplicate	Т	Solid	3050B	
Analysis Batch:360-5159	94				
LCS 360-51522/2-A	Lab Control Sample	Т	Solid	6010B	360-51522
LCSD 360-51522/3-A	Lab Control Sample Duplicate	Т	Solid	6010B	360-51522
MB 360-51522/1-A	Method Blank	Т	Solid	6010B	360-51522
360-25553-1	OC-SD-SD-SD1-0.0/0.5	Т	Solid	6010B	360-51522
360-25553-2	OC-SD-SD-SD2-0.0/0.5	Т	Solid	6010B	360-51522
360-25553-3	OC-SD-SD3-0.0/0.5	Т	Solid	6010B	360-51522
360-25553-4	OC-SD-SD-SD5-0.0/0.5	Т	Solid	6010B	360-51522
360-25553-5	OC-SD-SD-SD4-0.0/0.5	Т	Solid	6010B	360-51522
360-25553-6	OC-SD-SD-SD1-0.0/0.5 DUP	Т	Solid	6010B	360-51522
360-25553-6MS	Matrix Spike	Т	Solid	6010B	360-51522
360-25553-6MSD	Matrix Spike Duplicate	Т	Solid	6010B	360-51522
Report Basis					
T = Total					
General Chemistry					
Analysis Batch:360-5157		_			
360-25553-1	OC-SD-SD-SD1-0.0/0.5	Т	Solid	Moisture	
360-25553-2	OC-SD-SD2-0.0/0.5	Т	Solid	Moisture	
360-25553-3	OC-SD-SD3-0.0/0.5	Т	Solid	Moisture	
360-25553-4	OC-SD-SD-SD5-0.0/0.5	Т	Solid	Moisture	
360-25553-5	OC-SD-SD-SD4-0.0/0.5	Т	Solid	Moisture	
360-25553-6	OC-SD-SD1-0.0/0.5 DUP	T	Solid	Moisture	
360-25553-6MS	Matrix Spike	Т	Solid	Moisture	
360-25553-6MSD	Matrix Spike Duplicate	Т	Solid	Moisture	

#### Report Basis

T = Total

#### TestAmerica Westfield

#### **Quality Control Results**

2.00 g

Client: Olin Corporation Job Number: 360-25553-1

Method Blank - Batch: 360-51522 Method: 6010B Preparation: 3050B

Lab Sample ID: MB 360-51522/1-A Analysis Batch: 360-51594 Instrument ID: Varian 720 ES ICP

Client Matrix: Solid Prep Batch: 360-51522 Lab File ID: N/A

Dilution: 1.0 Units: mg/Kg Initial Weight/Volume:

Date Analyzed: 11/12/2009 1410 Final Weight/Volume: 100 mL
Date Prepared: 11/12/2009 0801

Analyte	Result	Qual	MDL	RL
Aluminum	ND		0.65	2.5
Chromium	ND		0.066	0.50
Iron	1.56	J	0.80	5.0

Lab Control Sample/ Method: 6010B
Lab Control Sample Duplicate Recovery Report - Batch: 360-51522 Preparation: 3050B

LCS Lab Sample ID: LCS 360-51522/2-A Analysis Batch: 360-51594 Instrument ID: Varian 720 ES ICP

Client Matrix: Solid Prep Batch: 360-51522 Lab File ID: N/A

Dilution: 1.0 Units: mg/Kg Initial Weight/Volume: 2.00 g

Date Analyzed: 11/12/2009 1413 Final Weight/Volume: 100 mL
Date Prepared: 11/12/2009 0801

LCSD Lab Sample ID: LCSD 360-51522/3-A Analysis Batch: 360-51594 Instrument ID: Varian 720 ES ICP

Client Matrix: Solid Prep Batch: 360-51522 Lab File ID: N/A

Dilution: 1.0 Units: mg/Kg Initial Weight/Volume: 2.00 g

Date Analyzed: 11/12/2009 1416 Final Weight/Volume: 100 mL Date Prepared: 11/12/2009 0801

% Rec. RPD LCS Analyte LCSD Limit RPD Limit LCS Qual LCSD Qual Aluminum 91 90 80 - 120 1 30 Chromium 92 80 - 120 30 91 0 91 90 80 - 120 0 30 Iron

Calculations are performed before rounding to avoid round-off errors in calculated results.

#### **Quality Control Results**

Client: Olin Corporation Job Number: 360-25553-1

Matrix Spike/ Method: 6010B

Matrix Spike Duplicate Recovery Report - Batch: 360-51522 Preparation: 3050B

MS Lab Sample ID: 360-25553-6 Analysis Batch: 360-51594 Instrument ID: Varian 720 ES ICP

Client Matrix: Solid Prep Batch: 360-51522 Lab File ID: N/A

Dilution: 1.0 Initial Weight/Volume: 1.91 g

Date Analyzed: 11/12/2009 1422 Final Weight/Volume: 100 mL Date Prepared: 11/12/2009 0801

MSD Lab Sample ID: 360-25553-6 Analysis Batch: 360-51594 Instrument ID: Varian 720 ES ICP

Client Matrix: Solid Prep Batch: 360-51522 Lab File ID: N/A

Dilution: 1.0 Initial Weight/Volume: 1.92 g

Date Analyzed: 11/12/2009 1425 Final Weight/Volume: 100 mL
Date Prepared: 11/12/2009 0801

% Rec. RPD Analyte MS MSD Limit **RPD Limit** MS Qual MSD Qual Aluminum -74 -397 75 - 125 14 35 4 Chromium 90 75 - 125 3 35 88 75 - 125 Iron -1300 -1760 18 35 4

#### **State Accreditation Matrix**

State where Primary Accreditation is Carried						
		New York			Florida	
Method Name	Description	(NELAC)	Mass	Conn	(NELAC)	North Carolina
821-R-02-012	Toxicity, Acute (48-Hour)(list upon request)				NP	
SM 4500 CI F	Chlorine, Residual		NP			
SM 9215B	Heterotrophic Plate Count (Pour Plate Method)		Р			
SM 9215E	Heterotrophic Plate Count (SimPlate)		Р			
SM 9221F	E.Coli (Multiple-Tube Fermentation; EC-MUG)		Р			
SM 9222B	Coliforms, Total (Membrane Filter)		Р			
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP			
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		Р			
200.8	Metals (ICP/MS) (list upon request)	NP/P	NP/P	NP/P		
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	NP/P		
6010B	Metals (ICP)(list upon request)	NP/SW		NP/SW		
245.1	Mercury (CVAA)	NP/P	NP	NP/P		
7470A	Mercury (CVAA)	NP		NP		
7471A	Mercury (CVAA)	SW		SW		
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P		
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P		
3010A	Preparation, Total Metals	NP/P		NP/P		
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW		
3050B	Preparation, Metals	SW		SW		
504.1	EDB, DBCP and 1,2,3-TCP (GC)		Р	Р		
608	Organochlorine Pest/PCBs (list upon request)	NP	NP	NP		
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP		NP		
3546	Microwave Extraction	SW				
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		NP		
3540C	Soxhlet Extraction					
3550B	Ultrasonic Extraction	SW		SW		
600/4-81-045	Polychlorinated Biphenyls (PCBs) (GC)		NP	NP		
8081A	Organochlorine Pesticides (GC)(list upon request)	NP/SW		NP/SW		
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW		
8270C	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW		
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)			NP/SW		
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
524.2	Volatile Org Comp (GC/MS)(list upon request)	Р	Р	Р		
524.2	Trihalomethanes		Р	Р		
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	NP		
5035	Closed System Purge and Trap	SW		SW		
5030B	Purge and Trap	NP		NP		
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW		
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
180.1	Turbidity, Nephelometric		Р	Р		
300	Anions, Ion Chromatography	NP/P	NP/P	NP/P		
410.4	COD	NP	NP	NP		
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW		SW		
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP	NP		
7196A	Chromium, Hexavalent	NP/SW		NP/SW		
9012A	Cyanide, Total and/or Amenable	NP/SW		NP/SW		
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		NP		
9040B	pH	NP		NP		
9045C	pH	SW		SW		
L107041C	Nitrogen, Nitrate	NP	Р	NP/P	1	†
L107-06-1B	Nitrogen Ammonia	NP	NP	NP/P		†
L204001A CN	Cyanide, Total		NP/P	NP/P		
L210-001A	Phenolics, Total Recoverable	NP	NP	NP		†
SM 2320B	Alkalinity	NP/P	NP/P	NP/P		†
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P		†
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P		†
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	NP		+
SM 3500 CR D	Chromium, Hexavalent	NP	*	NP		1
SM 4500 H+ B	pH	NP/P	NP/P	NP/P	<u> </u>	+
SM 4500 NO2 B	Nitrogen, Nitrite	NP	P	NP/P		+
SM 4500 NO2 B	Phosphorus, Orthophosphate	NP/P	NP	NP/P		+
SM 4500 P E	Phosphorus, Total	NP NP	NP	NP		+
SM 4500 P E SM 4500 S2 D		NP	INI	NP		+
	Sulfide, Total	NP NP	NP	NP NP		1
SM 5210B	BOD, 5-Day					1
SM 5310B	Organic Carbon, Total (TOC)	NP	NP	NP/P	Ī	

Not all organic compounds are accreditied under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory

The lab carries additional accreditations with several states. This is listing is subject to change based on the laboratories current certification standing.

#### **Login Sample Receipt Check List**

Client: Olin Corporation Job Number: 360-25553-1

Login Number: 25553 List Source: TestAmerica Westfield

Creator: Rinard, Kimberley A

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	5.6 C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified	True	

Testamerico

TestAmerica Laboratories, Inc.

Chain of Custody Form

•53 Southampton Road Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707

PO#		Comments (Special Instructions)	(choronich abodo)	MCP case narrative									Analysis:	% solid/moisture160.3M									Cooler ? (() N Samples Iced (1) N	Temp @ receipt:	Preservation/pH checked N ↑	By: CAN Date: UN 11 09
Job# 01 CANCO Quote#	500 000	Shaded areas for office use Analysis Requested	Check analysis and specify method	and analytes in comments section. For example:	500-series for drinking water	600-series for waste water 8000-series for haz/solid waste	Use comments section to further define.	-				Other										3	-1 Physins	Union Time:	Date: Time: II log (375	ield
	Project #: 6107-09-0016.04	Project Manager: P. Thompson	Work ID: Sediment	Contact: David Chapman	Bozulaton/ Classification / Special Report Format	-  <u>-</u>   <u>-</u>			Preservative	2 PA 601 10 PA 15	tainer  (P) or  (P) or	Grab Comp # Con Plastic Huos Hzsc Hcl tc Hcl tc Hcl tc NaOb NaOb	2 - 1 - 0 - 1 - 0 - 1 - 1 - 1 - 1 - 1 - 1	91 / 60/11/11	21 25 1 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0   / bolin/11	1   1   6   1   6   1   1   1   1   1	11:00	51 6011111	1   Solution   Co. 12)	13/11/09		Signature:		Time: Received by (A.)	TestAmerica-Westfield
:		ı.			Juscal	•	ssted: INPUES	72 hrs RCRA		ewater	9,19			SP ALC II		د ا		50 octy 11	11 24 GG	SP CFN				g	Date:	
	Client: Olin Chemical/MACTEC	Address: 51 Earnes Street	Wilmington MA 01887	•	Phone:	Turn Aro	(Std)XX   Rush TAT Requ	siness Day 24 hrs —		WW-Wastewater DW-Drinking water SW-Surfacewater LW-Labwater GW-Groundwater A-Air S-S-nix / Soil SI-Sludge O-Oil Z-Other			5-30105-05-05-06-50	.50-50 -5 02 - 0:010 5	5.0/0.0 - £05-Q5-Q5-Q5-	5.010.0-505-05-05-	-5010.0- Has-	474 5.0/0.	00-50-50-50-0-0-5 MS	A	li .		Sampled by (print):	Refinquished by:	Relinquished by:	Method of shipment:

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Version 1.2, Nov 2002

ACTION: If no, contact lab for submission of copy of completed COC.

## OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/2007

Reviewer/Date Chris Kicardi	3/18/X
Sr. Review/Date	
Lab Report # 25577	
Project # (107/00/6	

	Total Dissolved Al, Cr, A	Ja				
				80		
.0	Laboratory Deliverable Requirements	/				
	1.1 Laboratory Information: Was all of the following provided in the laboratory report?  Check items received.  Name of Laboratory   Address   Project   Phone #  Client Information:    Name    Address				Comments: ad Laboratory	
CTIC	ON: If no, contact lab for submission of missing or illegible information.					
ACIIC			/			
	1.2 Laboratory Report Certification Statement	Yes 🗾	No []	N/A [_]	Comments:	
Does th	the laboratory report include a completed Analytical Report Certification in the required fo	ormat?				
ACTIO	ON: If no, contact lab for submission of missing certification or certification with correct for	ormat.	/			
	1.3 Laboratory Case Narrative:	Yes [_]	No [_]	N/A []	Comments:	· ·
	☐ Narrative serves as an exception report for the project and method QA/QC perfor on the					of each discrepancy
				Certifica	tion Statement.	
<b>ACTIO</b>	ON: If no, contact lab for submission of missing or illegible information.					
	1.4 Chain of Custody (COC) copy present with all documentation completed	Yes [_]	No [_]	N/A [_]	Comments:	
	NOTE: Olin receives and maintains the original COC.					J.

					- 2	
1.5 Sample	Receipt Information (Cooler Receipt Form	present?):	Yes [_]	No []	N/A []	Comments:
Were each o	f the following tasks completed and recorded atory?	upon receipt of the sample(s)				
Sample temperature	e confirmed: must be 1° – 10° C. (If samples were	re sent by courier and delivered d (where applicable) 🗹 Field an	on the same	day as colle	ction, tempera	ture requirement does not apply).
ACTION: If no, cont	act lab for submission of missing or incomplete	documentation.				
1.5.1	Were all samples delivered to the laboratory v	without breakage?	Yes [_]	No [_]	N/A [_]	Comments:
1.5.2	Does the Cooler Receipt Form or Lab Narwith sample receipt, condition of the samples, circumstances affecting the quality of the data	, analytical problems or special	Yes []	No [_]	N/A [_]	Comments:
	Results Section: Was each of the following ry report for each sample?	requirements supplied in the	Yes [_]	No [_]	N/A [_]	Comments:
☑ Field ID and Lab ☐ Clean-up method ☑ Matrix	ID Date and time collected Analysis method Target analytes and concentrations	☐ Analyst Initials ☐ Preparation method / ☐ Uni	Dilution Date of pats (soils mus	Factor preparation/ t be reporte	₩A □ % i extraction/dige d in dry weigh	moisture or solids
	tact lab for submission of missing or incomplete		/			
1.7 QA/QC laboratory re	Information: Was each of the following port for each sample batch?	information supplied in the	Yes [_]	No [_]	N/A [_]	Comments:

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/		/	/					
Meth	nod blank results	LCS recoverie	es MS/MSD recoveries and RPDs				applicable)	
ACTIO	N: If no, contact	lab for submission	of missing or incomplete information.	Su	LCS D,	MSD		
	****				κ.			
2.0	<b>Holding Time</b>	<u>s</u>	ē1			/		
Have ar	ny technical hold exceeded? Hold water and soil.	ling times, determined in time for metals	ned from date of collection to date of is 180 days from sample collection to a	f analysis, been analysis for both	Yes []	No [	N/A]	Comments:
NOTE:	List samples that	exceed hold time v	vith # of days exceeded on checklist					
ACTIO	N: If technical l (UJ). If grossly	nolding times are exceeded (2X hold	xceeded, qualify all positive results (J) ing time) reject (R) all non-detect results	and non-detects s.				
		26 T/O B						
3.0	Laboratory M	<u>lethod</u>			,	/		
	3.1 Was t	he correct laborate	ory method used?		Yes 🗾	No []	N/A [_]	Comments:
	Water	Digestion	3005A or 3010A or 3020A					
	Soil D	Digestion	3050B					
	Metal	Š	6010B or 200.7	39				
comp	pared to the req o request varian	uested method. C ice.	ry to provide justification for magnetic contact senior chemist to inform Cl	lient of change	· /			
	3.2 Are the	he practical quant SOW 🖸 QAP	itation limits the same as those sp	pecified by the	Yes 🗾	No []	N/A [_]	Comments:
NOT	E: Verify that the	reported metals ma	atch the target list specified on the COC.					
	and the second s							
6010.de	oc							

ACT mois	TION: ture, et	If no, evaluate variation with respect to sample matrix, preparation, dilution, c. If sample PQL is indeterminate, contact lab for explanation.	. /			
	3.3	Are results present for each sample in the SDG?	Yes []	No []	N/A []	Comments:
ACTIC	N: If n	o, check Request for Analysis to verify if method was ordered and COC to verify that it				
	3.4	If dilutions were required, were dilution factors reported?	Yes [/]	No []	N/A [_]	Comments:
ACTIC	N: If n	o, contact the lab for submission.				
4.0	Meth	nod Blanks	)			
	4.1	Is the Method Blank Summary present?	Yes [/]	No []	N/A [_]	Comments:
ACT	TION:	If no, call the laboratory for submission of missing data.	J			
	4.2	Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?	Yes 🔟	No [_]	N/A [_]	Comments:
		If no, contact laboratory for justification. Consult senior chemist for action trate non-compliance.	1			
	4.3	Is the method blank less than the PQLs for all target elements?	Yes [	No []	N/A []	Comments:
NOT sam		DEP requires the method blank to be matrix matched and digested with the		/		
	4.4 the fo	Do any method blanks have positive results for metals? Qualify data according to llowing:	Yes []	No [/]	N/A [_]	Comments:

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If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the
PQL or the concentration reported if greater than the PQL.

If the sample concentration is  $> 5 \times$  blank value, no qualification is needed.

nts for each method blank including the concentration detected and the flagging level (flagging level

		or any blank with positive results, list all contaminants for each method blank value) and the associated samples and qualifiers.	including	ne concen	ration detec	ied and the na
5.0	Labo	ratory Control Standard	1			
	5.1	Was a laboratory control standard run with each analytical batch of 20 samples or less?	Yes [	No []	N/A [_]	Comments:
ACT	TION:	Langet, second source LCS is required by MADEP.  Call laboratory for LCS form submittal. If data are not available, use lyudgement to evaluate data accuracy associated with that batch.	/			
	5.2	Is a LCS Summary Form present?	Yes [/]	No []	N/A []	Comments:
AC.	ΓΙΟΝ:	If no, contact lab for resubmission of missing data.		1		
	5.3	Is the recovery of any analyte outside of MADEP control limits?  MADEP	Yes []	No [1]	N/A []	Comments:
	Samp	le Type % Rec				
	Wate	r 80-120 within Lab generated limits				
۸C	Soil	If recovery is above the upper limit, qualify all positive sample results				
with non-	in the detects	batch as (J). If recovery is below the lower limit, qualify all positive and results within the batch as (J). If LCS recovery is <30%, positive and non-				
dete	ct resul	ts are rejected (R).				ž

Comments:

#### 6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs collected? List project samples that were spiked.

Yes No N/A Comments:

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present?

Yes No N/A Comments:

NOTE: A <u>full</u> target, second source MS/MSD is required by MADEP.

- ACTION: If any matrix spike data are missing, call lab for resubmission.
  - 6.3 Were matrix spikes analyzed as indicated on the COC and project schedule?

Yes No N/A Comments

**ACTION**: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

6.4 Are any metal spike recoveries outside of the QC limits?

Yes []	No 🗾	N/A [_]	Comments:
		37	

	MADEP	QAPP	
Sample Type	% Rec	% Rec	Method
Water	75-125	N/A	6010B
Water	N/A	70-130	200.7
Soil	75-125	75-125	6010B

2555-6 Total/Dissolved OC-SW-18R

NOTE:  $%R = (SSR-SR) \times 100\%$  Where: SA

Where: SSR = Spiked sample result SR = Sample result

SA = Spike added

**NOTE:** If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.				
<b>ACTION:</b> MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).		/		
6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits?	Yes []	No [	N/A [_]	Comments:
NOTE: RPD = S-D x 100% Where: $S = MS$ sample result $D = MSD$ sample result				
<b>NOTE:</b> If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.				
<b>ACTION:</b> If the RPD exceeds the control limit, qualify positive results and non-detects (J).		35		
.0 <u>Laboratory Duplicate</u>			/	/
7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory	Yes []	No [_]	N/A	Comments:
7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Duplicate Sample Form present?  NOTE: MADEP refers to this sample as a "matrix duplicate".			See	LCSD
<b>ACTION:</b> If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.				
7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits?	Yes []	No []	N/A 🗹	Comments:

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MADEP Laboratory Duplicate Sample RPD Criteria:	QAPP RPD
For aqueous results > $5 \times RL$ , RPD must be $\pm 20\%$	20
For aqueous results < 5× RL, RPD must be ≤ RL	20
For soil/sediment results > 5× RL, RPD must be ±35%	20
For soil/sediment results < 5× RL, RPD must be ≤ 2× RL	20

**ACTION**: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

#### 8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

- 8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.
- 8.2 Do any rinsate blanks have positive results?

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is  $< 5 \times$  blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is  $> 5 \times$  blank value, no qualification is needed.

#### 9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes No No N/A Comments

No [] N/A [] Comments:

SW-18R + DWP

6010.doc

9.2 Were field duplicates collected per the required frequency?	Yes [_]	No [_]	N/A [_]	Comments:
SOW QAPP (1 per 10) MADEP Option 1 (1 per 20) MADEP Option 3 (1 per 10)	/			
9.3 Was the RPD $\leq$ 50% for soils or waters? Calculate the RPD for all results and attach to this review.	Yes 🔼	No [_]	N/A [_]	Comments:
ACTION: RPD must be ≤50% for soil and water. Qualify data (J) for both sample results in	if the RPD	exceeds 50	%.	
10.0 Special QA/QC				
10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal.	Yes 🔟	No 🔲	N/A [_]	Comments:
ACTION: If results for both total and dissolved are $\geq 5x$ the PQL and the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than $5x$ the PQL and the difference exceeds $2x$ the PQL, flag both results as estimated (J)	Dis.	Sadi Sampl	ivin l les.	nigh in subs

10.0	Application of Validation Qualifiers					
	Was any of the data qualified?	Yes [_	No []	N/A [_]	Comments:	
If so, app	oly data qualifiers directly to the DQE copy of laboratory report and flag pages for entry	in database.			e e	

#### REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

# OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS C1, S04, No 2, W3, NH 3, Cond.

Reviewer/Date CM Kran	V 3/18/19
Sr. Review/Date	//
Lab Report # 25577	
Project # 6107 200016	

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

1.0	Laboratory Deliverable Requirements	,				
	1.1 Laboratory Information: Was all of the following provided in the laboratory report?  Check items received.  Name of Laboratory  Address  Address  Address  Client Information:  Name  Address  Client Contact					
ACTIO	ON: If no, contact lab for submission of missing or illegible information.					
	1.2 Laboratory Report Certification Statement	Yes [_]	No [_]	N/A []	Comments:	
	Does the laboratory report include a completed Analytical Report Certification in the r	required forr	mat?			
ACTIO	N: If no, contact lab for submission of missing certification or certification with correct t		/			
	1.3 Laboratory Case Narrative:	Yes []	No []	N/A []	Comments:	
	☐ Narrative serves as an exception report for the project and method QA/QC performance.			2.7	ation of each discrepa	ncy on the
		Certi	fication State	ement.		
АСТІО	N: If no, contact lab for submission of missing or illegible information.					
	1.4 Chain of Custody (COC) copy present with all documentation completed?	Yes [_]	No []	N/A [_]	Comments:	
	Does the laboratory report include copies of Chain of Custody forms containing all samples in	this SDG?				
	NOTE: Olin receives and maintains the original COC.					
ACTIC	ON: If no, contact lab for submission of copy of missing completed COC.					
	1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?					

		Yes [_]	No []	N/A []	Comments:
Sample temperature	confirmed: must be $1^{\circ} - 10^{\circ}$ C. (If samples were sent by courier and delivered of	on the same o	lay as collect	ion, temperatu	are requirement does not apply).
Container type note	d Condition observed D pH verified (where applicable) D Field and lab II	Ds cross refe	renced		
1.5.1	act lab for submission of missing or incomplete documentation.  Were the correct bottles and preservatives used?  1 Liter polyethylene/H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C	Yes [_]	No []	N/A []	Comments:
	e – 1 Liter glass/HCL or H2SO4 to pH<2,cool to 4°C 1 Liter polyethylene/cool to 4°C				
Chloride, pl Nitrate/nitri	xygen Demand – 50 mL polyethylene/H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C H, sulfate, nitrate, nitrite - 50 mL polyethylene/cool to 4°C te - H2SO4 to pH<2,cool to 4°C				
	bon – 500 mL amber glass bottle/HCl or H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C				
	H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C adductance, TDS, TSS – 100 mL polyethylene/cool to 4°C				
container/volume (i	inform senior chemist. Document justification for change in f applicable), qualify positive and non-detect data (J) data if cooler 10°C. Rejection of data requires professional judgment	/			
1.5.2	Were all samples delivered to the laboratory without breakage?	Yes [ /	No []	N/A []	Comments:
1.5.3	Does the <i>Cooler Receipt Form</i> or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?	Yes []	No []	N/A []	Comments:

### **OLIN-WILMINGTON**

### LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

	Sample Resul report for each		following information supplied in	the laboratory	Yes [_	No []	N/A [_]	Comments:		
☐ Field ID	and Lab ID method	Date and time co	ollected Analyst Init	ials □ hod □ Date	Dilution Fa	nctor /extraction	/digestion clea	oisture or solids n-up and analysis,	Repor where applicabl	ting limits e
✓ Matrix		Target analytes and	concentrations	☐ Unit	(soils must be	e reported i	n dry weight)			
ACTION: I	f no, contact lab	for submission of miss	ing or incomplete information.							
	QA/QC Inform each sample bate		ng information provided in the l	aboratory report	Yes [_]	No []	N/A []	Comments:		
Method bl	lank results   The contact lab	LCS recoveries	MS/MSD recoveries and RPDs  No./NO. C/,  ng or incomplete information.	Laboratory	luplicate resul	lts (where a	pplicable)			
2.0 <u>Holo</u>	ding Times				Yes [_]	No [_]	N/A]	Comments:		
Have	e any technical	holding times, determine	ned from date of collection to da	ate of analysis, b	en exceeded?	? The hold	ing times are	as follows:		
			n demand, chloride, organic car							
	Alkalinity = 1				alyze immedi			nitrogen as $N = 4$	8 hrs V	
		n as N = 48 hrs	Sulfide, TDS, TSS = 7 days Nitrate + Nitrite as N = 28 days	ıys						
NO'			with # of days exceeded on chec							
	f technical hold d to qualify soils		l qualify results (J). For water s	amples that are					ect results. Pro	fessional
3.0	Laboratory	Method			Yes [_]	No []	N/A [_]	Comments:		
3.1 \	Was the correct	laboratory method used	?							
ACTION: If	no contact lab t	o provide justification f	or method change compared to t	ne requested met	od Contact se	enior chem	ist to inform C	lient of change or	to request variar	ice.

	3.2 Are the practical quantitation $\square$ QAPP/IRSWP $\square$ Lab?	limits the same as those spec	cified by the	Yes []	No [_]	N/A []	Comments:	to dilution
	Note: The MADEP QA/QC Guidelines of therefore all criteria will default to values s define criteria, QA/QC requirements defa may also apply.	tipulated in the QAPP*. Where the C	QAPP does no	t	in All	subset other Ar	of samples	to dilution
	Ammonia* 🗖 = 0.1 mg/ L	Alkalinity** $\square = 1 \text{ mg/L}$	n B	icarbonate Al	kalinity** 🗆	= 1 mg/L	Carbonate Alk	alinity** $\square = 1 \text{ mg/L}$
	Nitrate Nitrogen as N* □ = .05 mg/L	Nitrite Nitrogen as $N^* \square = .01$ r	ng/L	Chloride* □ =	1 mg/L		Hardness *□	= 2 mg/L
	Spec. Cond.** □ 3 umhos/cm	Total Organic Carbon** □ = 1	mg/L	Oil & Grease*	$\square = 5.5$ mg	/L	Sulfate (EP	A 300.0)* $\Box = 2 \text{ mg/L}$
	COD:* Low – 20 mg/L	COD* High - 50 mg/L □	1	TDS* □ = 10	mg/L		TSS* □ = 5 i	ng/L
	$pH* \square < 2 \text{ to} > 12$	Phenolic - 0.01 mg/L						
	Other parameter(list)	PQL =	_ □ Source	of PQL =			**************************************	
	Other parameter(list)	PQL =	_ □ Source	of PQL =				
	N: If no, evaluate change with respect to sa  3.3 Are the appropriate parameter results p  N: If no, check Request for Analysis to ver	present for each sample in the SDG?		Yes [_]	No [_]	N/A []	Comments:	ıta
	3.4 If dilutions were required, were dilution	n factors reported?		Yes []	No []	N/A []	Comments:	92
ACTIO	N: If no, contact the lab for submission.			زد	,			
4.0	Method Blanks			Yes 🔼	No [_]	N/A []	Comments:	
ACTIO	4.1 Are the Method Blank Summaries pre N: If no, call the laboratory for submission				-			
	4.2 Was a method blank analyzed for eac 20 or less?	h analysis batch of wet chemistry fie	eld samples of	Yes [_]	No [_]	N/A [_]	Comments:	

ACTIO	N: If no,	document discrepancy in case narrative and contact lab for justification. Consult seni	or chemist fo	or action need	led.			
	4.3 Is th	e method blank less than the PQL? (See Section 3.2 for PQLs).	Yes [ <u>/</u> ]	No [_]	N/A []	Comments:		
	accordin	any method blanks have positive results for wet chemistry parameters? Qualify data ag to the following: mple concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the	Yes []	No [_]	N/A [_]	Comments:		
	PQL or	the concentration reported if greater than the PQL.						
	If the sa	mple concentration is $> 5 \times$ blank value, no qualification is needed.						
	ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = 5 × blank value) on the checklist. List all affected samples and the qualifiers.							
5.0	Labora	tory Control Standards						
5.0	Labora	2	,					
	5.1	Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?	Yes []	No []	N/A []	Comments:		
		, call laboratory for LCS form submittal. If data is not available, use professional mine qualification actions for data associated with the batch.	ū.					
	5.2	Is a LCS Summary Form present?	Yes [_]	No []	N/A []	Comments:		
ACTIO	N: If no,	contact lab for resubmission of missing data.						
	5.3	Is any wet chemistry analyte LCS recovery outside the control limits?	Yes []	No [_]	N/A [_]	Comments:		

WET CHEM.doc

	LCS Limits:								
T O	Alkalinity** $\square = 80\text{-}120\%$ Fotal Organic Carbon** $\square = 80\text{-}120\%$ COD Low* $\square = 80\text{-}120\%$ Hardness* $\square = 80\text{-}120\%$	Carbon** $\Box = 80\text{-}120\%$ TDS** $\Box = 80\text{-}120\%$ Oil & C $\Box = 80\text{-}120\%$ COD High* $\Box = 80\text{-}120\%$ Nitrate			y** □ = 80- 80-120% as N** □ = y)* □ = 80-	80-120%		= 80-120% N* = 80-120% ** □ = 80-120% TSS* NA	
(	Other parameter(list)	%R =			□ Rec Lin	nits=			
(	Other parameter(list)	%R =			□ Rec Lin	nits =			
		(MADEP has not yet defined LCS recove	ery limits for t	wet che	mistry ana	lyses.)			
within the	ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).  Matrix Spikes								
								NHZ	55-1115
		requencies based on monthly, quarterly, ents for each set with the senior chemist.						)	55-1115 Jall
		s analyzed? List project samples that were sp	oiked.	. /1	No[]	N/A []	Comments:		
	: If no, contact senior chemist to see if a		103	ر نا ه	110	17/21	Comments		_
	5.2 Is the MS/MSD Recovery Form: If no, contact lab for resubmission of		Yes	$s \lfloor \underline{l} \rfloor$	No []	N/A []	Comments:	00	C-SW-1818
		at the required frequency of 1 per 20 samp	ples per Yes	s 🔼	No []	N/A []	Comments:		
ACTION	: If any matrix spike data is missing, ca	all lab for resubmission.							
6	Are any wet chemistry analyte	spike recoveries outside of the QC limits?	Yes	s [/]	No []	N/A []	Comments:		

### OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST

### WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

	NOTE: %R = (S: SA	SR-SR) x 100%		Where	:: SSR	= 8	Spiked samp SR = Sam	
		SA = Spike added						
	MS/MSD Recovery Limits:						/	<del>.</del>
	Alkalinity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity*	=NA	Ammonia* (L	ACHAT)	<b>Z</b> = 75-125%	out
	Alkalinity* = NA Chloride*(SM 4500 Cl) ☐= 75-125%	Specific Conductivity * = NA	Total Organic Carbon	$n^* = NA$	TDS** = NA		/	
		COD Low* $\Box = 75-125\%$	Total Organic Carbon COD High* □ = 75-	125%	Nitrate Nitrog	en as N**	<b>2</b> = 75-125%	
	Oil & Grease* = NA Nitrite Nitrogen as N** 🖸 = 75-125%	Hardness* $\square = 75-125\%$	Sulfate (EPA 300.0)*	* <b>Z</b> = 75-125%	$pH^* = NA$	7	$\Gamma SS^* = NA$	
	Other parameter(list)	% R =		☐ Rec Lim	its =			
	* = Laboratory Limits ** = 0	Olin QAPP Limits (MADEP has not	yet defined LCS reco	overy limits for	wet chemistry	analyses.	.)	
	NOTES: 1) If only one of the recoveries f		trol limits, no qualifica	tion is necessary	<u> </u>	358		ISD flags.
qualify 1	N: MS/MSD flags only apply to the sample positive results as estimated (J). If the record recovery is < 30% and the sample is non-	veries of the MS and MSD are lower th	an the lower control lir	. If the recoverient but > 30%, q	es of the MS an qualify both pos	d MSD exc sitive result	ceed the upper costs and non-detec	ontrol limi ts (J). If th
	N: Laboratory control limits apply when sed, but no flags are applied.	piked sample results fall within the norm	nal calibration range. It	f dilutions are re	equired due to h	nigh sample	e concentrations	, the data i
* / *********	6.5 Are any RPDs for MS/MSD recoveries	s outside of the OA/OC limits?		/				
	<b>NOTE:</b> RPD = $\frac{S - D}{(S + D)/2}$ x 100% Wh	A A	Yes []	No [] N	/A [_] Co	mments:		
	MS/MSD RPD Limits:							
	RPD ≤20							
7.0	<u>Laboratory Duplicate</u>		,					
	Are the RPDs for the laboratory duplicate	es <20% unless otherwise specified belo	ow? Yes [_]	No [_] N	//A [] Co	mments:	Corbuct	into
								1

ACTIO	ACTION: If the RPD is greater than specified limits, qualify all results for that analyte as estimated (J).								
	pH* □ = 3%	Specific Conductivity *□ = 5%	TSS** □ = 6%		1	TDS** □ = 6%	6		
8.0	Sampling Accuracy								
	he majority of ground water samples are collected directly from a tap, process stream, or ith dedicated tubing. Rinse blanks will not be collected.								
	8.1 Were rinsate blanks coll associated samples from the s	lected? Prior to evaluating rinsate blan senior chemist.	nks, obtain a list of the	Yes []	No [	N/A [_]	Comments:		
	8.2 Do any rinsate blanks hav	ve positive results?		Yes [_]	No [_]	N/A 1	Comments:		
	ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below.  If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.  If the sample concentration is > 5 × blank value, no qualification is needed.								
9.0	Field Duplicates								
	9.1 Were field duplicate s field duplicates.	samples collected? Obtain a list of samp	oles and their associated	Yes [_]	No []	N/A []	Comments:		
QA		Illected per the required frequency?  otion 1(1 per 20)	on 3 (1 per 10) □	Yes [_]	No [_]	N/A []	Comments:		
	9.3 Was the RPD $\leq$ 30% for attach to this review.	waters ≤ 50% for soils? Calculate the	RPD for results and	Yes 🔼	No []	N/A []	Comments:		

ACTION: Qualify data (J) for both sample results if the RPD exceeded.

Was any of the data qualified?

Yes No No N/A N/A

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

#### REFERENCES:-

MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts.; Project No. 6300-06-0010/41.1; July 25, 2007.

Massachusetts Department of Environmental Protection (MADEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.





#### ANALYTICAL REPORT

Job Number: 360-25577-1

Job Description: Olin Chemical Surface Water Quarterly

For:

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Attention: Mr. Steven Morrow

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY:

Joseph a. Cheur J.

Approved for release.
Joe Chimi
Report Production Representative
11/25/2009 11:37 AM

Designee for
Becky C Mason
Project Manager II
becky.mason@testamericainc.com
11/25/2009

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY ELAP 10843, North Carolina 647, NELAP PA 68-04386. Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002.



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Laborator	y Name:	lame: <b>TestAmerica Westfield</b> Project #:			ect #:	#: 360-25577		-1	
Project Lo	cation:				MADEP F	RTN <sup>1</sup> :			
		cations for the f	ollowing data set	:[list Laborator	y Sample ID Nur	nber(s)]			
360-2557	7-(1-8)								
Sample M	latrices:	Groundwater	Soil/Se	diment	Drinking Wate	r <b>Othe</b>	r:		
MCP SW	<b>/-846</b>	8260B( )	8151A ( )	8330 ( )	6010B ( <b>x</b> )	7470A/1A (	)	Othe	r ( )
Methods	Used	8270C( )	8081A ( )	VPH()	6020 ()	9014M <sup>2</sup> /90	)12 ( )		
•	ed in MADEP	8082 ( )	8021B ( )	EPH()	7000 S <sup>3</sup> ( )	7196A ( )			
Compend			e Tracking Numb	, ,		hla Cuanida	· (DAC)	Matha	۵
•	Methods. that apply)			•	siologically Availa ividual method ai	-	e (PAC)	ivietno	u
	,						."		
					for "Presumptiv	e Certainty		15	1
Α	•		y the laboratory in of-Custody docur				Yes √		No <sup>1</sup>
			•						
_		•	required for the s		, ,		Yes		No <sup>1</sup>
В		•	ed, including the r	•			V		
	standards or g		a that did not me	ет арргорпате	periormance				
									1
_		•	ıded in this repor		•	_	Yes	N/A	No <sup>1</sup>
С		•		` ,	(b), (c) and (d) o	f	V		
			VII A, " Quality A		•				
			quisition and Rep						
_					d conducted with	out	Yes	N/A	No <sup>1</sup>
D	significant mo	difications (see	Section 11.3 of	respective Me	thods)?			٧	
	A respons	se to question	s E and F below	/ is required f	or "Presumptive	Certainty	" statu:		
E			andards and reco				Yes		No <sup>1</sup>
_		nods achieved?					√		
F	Were results f	or all analyte-li	st compounds/ele	ements for the	specified		Yes	N/A	No <sup>1</sup>
	method(s) rep	•	·		•				$\checkmark$
	<sup>1</sup> All Negative r	responses mus	t be addressed in	n an attached l	Environmental La	boratory ca	se narr	ative.	
, the und					that, based upo				
nquiry of	those respons	sible for obtai	ning the informa	ation, the mat	erial contained	in this			
analytical	l report is, to th	ne best of my	knowledge and	belief, accura	te and complete	<b>)</b> .			
		11	~/-						
	Signature:	200	tarling		Position:	Laborato	y Dire	ctor	
	Printed Name:	Steven C. H	artmann		Date:	1	1/25/09	11:29	
'ho oortificatio	form has been electronica				CAM VII	A, Rev 3.2		A	oril-04
ne certification					TestAmerica Westfield				
ne certification		MADEP MA014	NELAP FL E87912 TOX						
Test <sub>A</sub>	merica	MADEP MA014 NY DOH 10843	NELAP FL E87912 TOX NELAP NJ MA008 TOX		53 Southampton Rd,				
Test <sub>A</sub>	Merica ENVIRONMENTAL TESTING			SEC IN ACCORDING					

Laborator	y Name:	lame: TestAmerica Westfield Project #:			360-25577-1				
Project Lo	cation:				MADEP	RTN <sup>1</sup> :			
This form	provides certific	cations for the f	ollowing data se	et:[list Laborator	/ Sample ID Nur	mber(s)]			
360-2557	7-(1-8)								
Sample M	atrices:	Groundwater	Soil/S	ediment	Drinking Wate	r <b>Oth</b>	er:		
MCP SW	/-846	8260B( )	8151A ( )	8330 ( )	6010B ( )	7470A/1A	( )	Other	. ( <b>x</b> )
Methods	Used	8270C( )	8081A ( )	VPH()	6020 ()	9014M <sup>2</sup> /9	` '		
	ed in MADEP	8082 ( )	8021B ( )	EPH()	7000 S <sup>3</sup> ( )	7196A (	)		
Compend	ium of Methods.		•	iber (RTN), if kn or MADEP Phys		abla Cvani	40 (DAC	`\ Motho	٨
•	that apply)			Series List indi		-	•	) WEUTO	u
	,	nse to questic	ons A. B. C. and	D is required t	or "Presumptiv	ve Certain	tv" stat	IIS	
A				in a condition co		ro oortain	Yes		No <sup>1</sup>
A			•	mentation for th			√		INO
	Were all QA/C	QC procedures	required for the	specified analyt	ical method(s)		Yes		No <sup>1</sup>
В		-	_	requirement to			√		
			a that did not m	eet appropriate	performance				
	standards or g	guidelines?							
	Does the anal	ytical data inclu	ided in this repo	ort meet all the re	equirements		Yes	N/A	No <sup>1</sup>
С	•	•		Section 2.0 (a),	. , . , . , . ,	of		$\sqrt{}$	
			•	Assurance and (	-				
	Control Guide	lines for the Ac	quisition and Re	eporting of Analy	ticai Data"?				
			<b>-</b>	or EPH Method		nout	Yes	N/A	No <sup>1</sup>
D	significant mo	difications (see	Section 11.3 of	f respective Met	nods)?			٧	
	A respons	se to question	s E and F belo	w is required fo	or "Presumptive	e Certaint	y" statı	ıs	
E				commendations			Yes		No <sup>1</sup>
	·	nods achieved?							
F	Were results f	for all analyte-lis	st compounds/e	lements for the	specified		Yes	N/A	No <sup>1</sup>
	method(s) rep	orted?						$\sqrt{}$	
	<sup>1</sup> All Negative i	responses mus	t be addressed	in an attached E	invironmental La	aboratory o	ase na	rative.	
, the und	ersigned, attes	st under the pa	ains and penalt	ties of perjury t	hat, based upo	n my pers	onal		
	-		_	nation, the mate					
analytical	report is, to th	ne best of my	knowledge and	l belief, accura	e and complete	е.			
	Signature:	St	Hastin		Position	: Laborate	ory Dire	ector	
	Printed Name:	Steven C. Ha	artmann		_ Date:	:	11/25/0	9 11:29	
he certification	form has been electronica	ally signed and approved			CAM VII	A, Rev 3.2		А	pril-04
T L A		MADEP MA014	NELAP FL E87912 TO		TestAmerica Westfield	d			
lest <sub>A</sub>	merica	NY DOH 10843 RI DOH 57	NELAP NJ MA008 TOX NELAP NY 10843		53 Southampton Rd, Westfield, MA 01085				
THE LEADER IN	ENVIRONMENTAL TESTING	CT DPH 0494	NH DES 253901-A	STEO IN ACCORDANCE	Tel:(413)572-4000				
		VT DECWSD		<b>% 1840</b>	Fax:(413)572-3707				

#### **CASE NARRATIVE**

**Client: Olin Corporation** 

**Project: Olin Chemical Surface Water Quarterly** 

Report Number: 360-25577-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes or interferences which exceed the calibration range of the instrument.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

#### **RECEIPT**

The samples were received on 11/12/2009; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

MCP regulatory standard criteria were not specified for this report. Therefore, method reporting limits (RLs) were not assessed against any MCP standards as it may pertain to Question "E" on the Presumptive Certainty Certification Form (MADEP reference: WSC-CAM-AN-093008 - WSC-CAM Analytical Notes).

#### **TOTAL METALS**

Samples 360-25577-1 through 360-25577-8 were analyzed for total metals in accordance with EPA SW-846 Method 6010B. The samples were prepared and analyzed on 11/13/2009.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No difficulties were encountered during the metals analyses.

All quality control parameters were within the acceptance limits.

#### **DISSOLVED METALS**

Samples 360-25577-1 through 360-25577-8 were analyzed for dissolved metals in accordance with EPA SW-846 Method 6010B. The samples were analyzed on 11/13/2009.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No difficulties were encountered during the dissolved metals analyses.

All quality control parameters were within the acceptance limits.

#### **ANIONS**

Samples 360-25577-1 through 360-25577-8 were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 11/13/2009.

Samples 360-25577-1 through 360-25577-8(10X) required dilution prior to analysis due to high target concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the anions analyses.

All quality control parameters were within the acceptance limits.

### **AMMONIA**

Samples 360-25577-1 through 360-25577-8 were analyzed for ammonia in accordance with LACHAT 107-06-1B. The samples were prepared and analyzed on 11/24/2009.

Ammonia failed the recovery criteria low for the MS of sample 360-25577-6 in batch 360-52157. The presence of the '4' qualifier in the report indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. The associated LCS recovered within control limits. Refer to the QC report for details.

Samples 360-25577-2(10X), 360-25577-3(10X), 360-25577-4 through 360-25577-7(5X) and 360-25577-8(10X) required dilution prior to analysis due to high concentration. The reporting limits have been adjusted accordingly.

No other difficulties were encountered during the ammonia analyses.

All other quality control parameters were within the acceptance limits.

### **SPECIFIC CONDUCTANCE**

Samples 360-25577-1 through 360-25577-8 were analyzed for specific conductance in accordance with SM 2510B. The samples were analyzed on 11/13/2009.

No difficulties were encountered during the specific conductance analyses.

All quality control parameters were within the acceptance limits.

# **EXECUTIVE SUMMARY - Detections**

Lab Sample ID C Analyte	lient Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-25577-1	OC-SW-ISCO3				
Aluminum Sodium Sulfate Nitrate as N Chloride Ammonia Specific Conductance		55 J 60000 31 0.97 160 1.5 650	100 2000 2.0 0.050 10 0.10 1.0	ug/L ug/L mg/L mg/L mg/L mg/L umhos/cm	6010B 6010B 300.0 300.0 300.0 L107-06-1B SM 2510B
<b>Dissolved</b> Sodium		79000	2000	ug/L	6010B
360-25577-2	OC-SW-ISCO2				
Aluminum Chromium Sodium Sulfate Nitrate as N Chloride Ammonia Specific Conductance		350 68 120000 510 1.4 170 83 1600	100 5.0 2000 20 0.050 10 1.0	ug/L ug/L ug/L mg/L mg/L mg/L mg/L umhos/cm	6010B 6010B 6010B 300.0 300.0 107-06-1B SM 2510B
Dissolved Aluminum Chromium Sodium		110 29 150000	100 5.0 2000	ug/L ug/L ug/L	6010B 6010B 6010B
360-25577-3	OC-SW-PZ16RR				
Aluminum Chromium Sodium Sulfate Nitrate as N Chloride Ammonia Specific Conductance		4800 1000 150000 380 3.9 250 57 1600	100 5.0 2000 20 0.050 10 1.0	ug/L ug/L ug/L mg/L mg/L mg/L umhos/cm	6010B 6010B 6010B 300.0 300.0 300.0 L107-06-1B SM 2510B
Dissolved Aluminum Chromium Sodium		93 J 60 170000	100 5.0 2000	ug/L ug/L ug/L	6010B 6010B 6010B

# **EXECUTIVE SUMMARY - Detections**

Lab Sample ID Cl Analyte	lient Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-25577-4	OC-SW-PZ17RR				
Aluminum Chromium Sodium Sulfate Nitrate as N		3400 770 130000 250 4.0	100 5.0 2000 20 0.050	ug/L ug/L ug/L mg/L mg/L	6010B 6010B 6010B 300.0 300.0
Chloride Ammonia Specific Conductance		240 37 1300	10 0.50 1.0	mg/L mg/L umhos/cm	300.0 L107-06-1B SM 2510B
<b>Dissolved</b> Aluminum Chromium Sodium		70 J 68 150000	100 5.0 2000	ug/L ug/L ug/L	6010B 6010B 6010B
360-25577-5	OC-SW-SD17				
Aluminum Chromium Sodium Sulfate Nitrate as N Chloride Ammonia Specific Conductance		2700 620 130000 200 4.3 230 28 1300	100 5.0 2000 20 0.050 10 0.50 1.0	ug/L ug/L ug/L mg/L mg/L mg/L umhos/cm	6010B 6010B 6010B 300.0 300.0 300.0 L107-06-1B SM 2510B
Dissolved Aluminum Chromium Sodium		70 J 59 140000	100 5.0 2000	ug/L ug/L ug/L	6010B 6010B 6010B
360-25577-6	OC-SW-18R				
Aluminum Chromium Sodium Sulfate Chloride Ammonia Specific Conductance		290 36 74000 140 110 36 800	100 5.0 2000 20 10 0.50 1.0	ug/L ug/L ug/L mg/L mg/L mg/L umhos/cm	6010B 6010B 6010B 300.0 300.0 L107-06-1B SM 2510B
<b>Dissolved</b> Aluminum Chromium Sodium		75 J 12 82000	100 5.0 2000	ug/L ug/L ug/L	6010B 6010B 6010B

# **EXECUTIVE SUMMARY - Detections**

Lab Sample ID C	Client Sample ID	Result / Q	ualifier	Reporting Limit	Units	Method
360-25577-7	OC-SW-18R-DUP					
Aluminum		280		100	ug/L	6010B
Chromium		34		5.0	ug/L	6010B
Sodium		71000		2000	ug/L	6010B
Sulfate		150		20	mg/L	300.0
Chloride		110		10	mg/L	300.0
Ammonia		33		0.50	mg/L	L107-06-1B
Specific Conductance		800		1.0	umhos/cm	SM 2510B
Dissolved						
Aluminum		84	J	100	ug/L	6010B
Chromium		13		5.0	ug/L	6010B
Sodium		83000		2000	ug/L	6010B
360-25577-8	OC-SW-ISCO1					
Aluminum		280		100	ug/L	6010B
Chromium		34		5.0	ug/L	6010B
Sodium		71000		2000	ug/L	6010B
Sulfate		150		20	mg/L	300.0
Chloride		120		10	mg/L	300.0
Ammonia		33		1.0	mg/L	L107-06-1B
Specific Conductance		790		1.0	umhos/cm	SM 2510B
Dissolved						
Aluminum		73	J	100	ug/L	6010B
Chromium		12		5.0	ug/L	6010B
Sodium		81000		2000	ug/L	6010B

## **METHOD SUMMARY**

Client: Olin Corporation Job Number: 360-25577-1

Description	Lab Location	Method Preparation Method
Matrix: Water		
Dissolved Metals	TAL WFD	SW846 6010B
Total Metals	TAL WFD	SW846 6010B
Sample Filtration, Field	TAL WFD	FIELD_FLTRD
Preparation, Total Metals	TAL WFD	SW846 3010A
Chloride & Sulfate	TAL WFD	40CFR136A 300.0
Nitrate & Nitrite	TAL WFD	40CFR136A 300.0
Nitrogen Ammonia	TAL WFD	LACHAT L107-06-1B
Distillation, Ammonia	TAL WFD	Distill/Ammonia
Conductivity, Specific Conductance	TAL WFD	SM SM 2510B

### Lab References:

TAL WFD = TestAmerica Westfield

### **Method References:**

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

# METHOD / ANALYST SUMMARY

Method	Analyst	Analyst ID
SW846 6010B	Smith, Tim J	TJS
40CFR136A 300.0	Lalashius, Andrew L	ALL
LACHAT L107-06-1B	Lalashius, Andrew L	ALL
SM SM 2510B	Emerich, Rich W	RWE

# **SAMPLE SUMMARY**

			Date/Time	Date/Time
Lab Sample ID	Client Sample ID	Client Matrix	Sampled	Received
360-25577-1	OC-SW-ISCO3	Water	11/12/2009 0855	11/12/2009 1645
360-25577-2	OC-SW-ISCO2	Water	11/12/2009 0910	11/12/2009 1645
360-25577-3	OC-SW-PZ16RR	Water	11/12/2009 0930	11/12/2009 1645
360-25577-4	OC-SW-PZ17RR	Water	11/12/2009 0950	11/12/2009 1645
360-25577-5	OC-SW-SD17	Water	11/12/2009 1005	11/12/2009 1645
360-25577-6	OC-SW-18R	Water	11/12/2009 1020	11/12/2009 1645
360-25577-6MS	OC-SW-18R-MS	Water	11/12/2009 1020	11/12/2009 1645
360-25577-6MSD	OC-SW-18R-MSD	Water	11/12/2009 1020	11/12/2009 1645
360-25577-7	OC-SW-18R-DUP	Water	11/12/2009 1020	11/12/2009 1645
360-25577-8	OC-SW-ISCO1	Water	11/12/2009 1050	11/12/2009 1645

# **SAMPLE RESULTS**

Mr. Steven Morrow Job Number: 360-25577-1 Olin Corporation

3855 North Ocoee Street

Suite 200

Cleveland, TN 37312-4441

Client Sample ID:

OC-SW-ISCO3

Lab Sample ID:

360-25577-1

Date Sampled:

11/12/2009 0855

Date Received: 11/12/2009 1645

Client Matrix:

Analyte	Result/Quali	fier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Ar	nalyzed: 11	/13/2009 1514	
Aluminum	ND		ug/L	39	100	1.0
Chromium	ND		ug/L	1.3	5.0	1.0
Sodium	79000 🥤		ug/L	250	2000	1.0
Method: 6010B			Date Ar	nalyzed: 11	/13/2009 1426	
Prep Method: 3010A			Date Pr	epared: 11	/13/2009 0746	
Aluminum	55	J	ug/L	39	100	1.0
Chromium	ND		ug/L	1.3	5.0	1.0
Sodium	60000 🥣		ug/L	250	2000	1.0

Mr. Steven Morrow Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441 Job Number: 360-25577-1

Client Sample ID:

OC-SW-ISCO3

Lab Sample ID:

360-25577-1

Date Sampled: 11/12/2009 0855

Date Received: 11/12/2009 1645

Client Matrix:

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed: 11/	13/2009 1653	
Sulfate	31	mg/L	2.0	2.0	1.0
Nitrate as N	0.97	mg/L	0.050	0.050	1.0
Nitrite as N	ND	mg/L	0.010	0.010	1.0
Method: 300.0		Date Anal	yzed: 11/	13/2009 1708	
Chloride	160	mg/L	10	10	10
Method: L107-06-1B	94	Date Anal	yzed: 11/2	24/2009 1537	
Prep Method: Distill/Ammonia		Date Prep	ared: 11/2	24/2009 1333	
Ammonia	1.5 3	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Anal	yzed: 11/	13/2009 0929	
Specific Conductance	650	umhos/cm	1.0	1.0	1.0

Job Number: 360-25577-1 Mr. Steven Morrow

Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID:

OC-SW-ISCO2

Lab Sample ID:

360-25577-2

Date Sampled: 11/12/2009 0910

Date Received: 11/12/2009 1645

Client Matrix:

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Ar	nalyzed:	11/13/2009 1522	
Aluminum	110	ug/L	39	100	1.0
Chromium	29	ug/L	1.3	5.0	1.0
Sodium	150000 🍑	ug/L	250	2000	1.0
Method: 6010B		Date Ar	alyzed:	11/13/2009 1429	
Prep Method: 3010A		Date Pr	epared:	11/13/2009 0746	
Aluminum	350	ug/L	39	100	1.0
Chromium	68	ug/L	1.3	5.0	1.0
Sodium	120000 <b>T</b>	ug/L	250	2000	1.0

Mr. Steven Morrow Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441 Job Number: 360-25577-1

Client Sample ID:

OC-SW-ISCO2

Lab Sample ID:

360-25577-2

Date Sampled:

11/12/2009 0910

Date Received:

11/12/2009 1645

Client Matrix:

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed: 11/1:	3/2009 1725	
Nitrate as N	1.4	mg/L	0.050	0.050	1.0
Nitrite as N	ND	mg/L	0.010	0.010	1.0
Method: 300.0	*	Date Anal	yzed: 11/1:	3/2009 1740	
Sulfate	510	mg/L	20	20	10
Chloride	170	mg/L	10	10	10
Method: L107-06-1B		Date Anal	yzed: 11/2	4/2009 1612	
Prep Method: Distill/Ammonia		Date Prep	ared: 11/2	4/2009 1333	
Ammonia	83 <b>J</b>	mg/L	1.0	1.0	10
Method: SM 2510B		Date Anal	yzed: 11/1	3/2009 0932	
Specific Conductance	1600	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow Olin Corporation 3855 North Ocoee Street

Suite 200

Cleveland, TN 37312-4441

Client Sample ID: Lab Sample ID:

OC-SW-PZ16RR

360-25577-3

Date Sampled: 11/12/2009 0930

Job Number: 360-25577-1

Date Received: 11/12/2009 1645

Water

Client Matrix:

				5.0	
Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date A	nalyzed: 11/	13/2009 1526	
Aluminum	93 J	ug/L	39	100	1.0
Chromium	60	ug/L	1.3	5.0	1.0
Sodium	170000 <b>T</b>	ug/L	250	2000	1.0
Method: 6010B		Date A	nalyzed: 11/	13/2009 1432	
Prep Method: 3010A		Date P	repared: 11/	13/2009 0746	
Aluminum	4800	ug/L	39	100	1.0
Chromium	1000	ug/L	1.3	5.0	1.0
Sodium	150000	ug/L	250	2000	1.0

Mr. Steven Morrow Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: Lab Sample ID:

OC-SW-PZ16RR

360-25577-3

Date Sampled: 11/12/2009 0930

Date Received: 11/12/2009 1645

Client Matrix:

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/13/2009 1756	
Nitrate as N	3.9	mg/L	0.050	0.050	1.0
Method: 300.0		Date Anal	yzed:	11/13/2009 1811	
Sulfate	380	mg/L	20	20	10
Chloride	250	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	.10
Method: L107-06-1B		Date Anal	yzed:	11/24/2009 1613	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 1333	
Ammonia	57 🚺	mg/L	1.0	1.0	10
Method: SM 2510B		Date Anal	yzed:	11/13/2009 0934	
Specific Conductance	1600	umhos/cm	1.0	1.0	1.0

Job Number: 360-25577-1 Mr. Steven Morrow Olin Corporation

3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID:

OC-SW-PZ17RR

Lab Sample ID:

360-25577-4

Date Sampled: 11/12/2009 0950

Date Received: 11/12/2009 1645

Client Matrix:

Analyte	Result/Qual	ifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Ar	alyzed: 11/	13/2009 1529	
Aluminum	70	J	ug/L	39	100	1.0
Chromium	68		ug/L	1.3	5.0	1.0
Sodium	150000	7	ug/L	250	2000	1.0
Method: 6010B			Date Ar	alyzed: 11/	13/2009 1435	
Prep Method: 3010A			Date Prepared: 11/13/20		13/2009 0746	
Aluminum	3400		ug/L	39	100	1.0
Chromium	770		ug/L	1.3	5.0	1.0
Sodium	130000	7	ug/L	250	2000	1.0

Mr. Steven Morrow Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: Lab Sample ID:

OC-SW-PZ17RR

360-25577-4

Date Sampled: 11/12/2009 0950

Date Received: 11/12/2009 1645

Client Matrix:

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed:	11/13/2009 1856	
Nitrate as N	4.0	mg/L	0.050	0.050	1.0
Method: 300.0		Date Anal	yzed:	11/13/2009 1911	
Sulfate	250	mg/L	20	20	10
Chloride	240	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B		Date Anal	yzed:	11/24/2009 1614	
Prep Method: Distill/Ammonia		Date Prep	ared:	11/24/2009 1333	
Ammonia	37 🍼	mg/L	0.50	0.50	5.0
Method: SM 2510B		Date Anal	yzed:	11/13/2009 0935	
Specific Conductance	1300	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow

Job Number: 360-25577-1

Olin Corporation

3855 North Ocoee Street Suite 200

Cleveland, TN 37312-4441

 Client Sample ID:
 OC-SW-SD17
 Date Sampled:
 11/12/2009 1005

 Lab Sample ID:
 360-25577-5
 Date Received:
 11/12/2009 1645

Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date A	nalyzed: 11/1	3/2009 1532	
Aluminum	70 J	ug/L	39	100	1.0
Chromium	59	ug/L	1.3	5.0	1.0
Sodium	140000	ug/L	250	2000	1.0
Method: 6010B		Date A	nalyzed: 11/1	3/2009 1438	
Prep Method: 3010A		Date P	repared: 11/1	3/2009 0746	
Aluminum	2700	ug/L	39	100	1.0
Chromium	620	ug/L	1.3	5.0	1.0
Sodium	130000	ug/L	250	2000	1.0

Mr. Steven Morrow Olin Corporation 3855 North Ocoee Street

Suite 200

Cleveland, TN 37312-4441

Client Sample ID: Lab Sample ID:

OC-SW-SD17

360-25577-5

Date Sampled:

11/12/2009 1005

Date Received: 11/12/2009 1645

Job Number: 360-25577-1

Client Matrix:

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed: 11/	13/2009 1926	
Nitrate as N	4.3	mg/L	0.050	0.050	1.0
Method: 300.0		Date Anal	yzed: 11	13/2009 1941	
Sulfate	200	mg/L	20	20	10
Chloride	230	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B		Date Anal	yzed: 11	24/2009 1615	
Prep Method: Distill/Ammonia		Date Prep	ared: 11	24/2009 1333	
Ammonia	28 丁	mg/L	0.50	0.50	5.0
Method: SM 2510B		Date Anal	yzed: 11	13/2009 0936	
Specific Conductance	1300	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441 Job Number: 360-25577-1

Client Sample ID:

OC-SW-18R

Lab Sample ID:

360-25577-6

Date Sampled:

11/12/2009 1020

Date Received: 11/12/2009 1645

Client Matrix:

Analyte	Result/Qua	ifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Ar	nalyzed: 1	1/13/2009 1502	
Aluminum	75	J	ug/L	39	100	1.0
Chromium	12		ug/L	1.3	5.0	1.0
Sodium	82000 🦪		ug/L	250	2000	1.0
Method: 6010B			Date Ar	nalyzed: 1	1/13/2009 1446	
Prep Method: 3010A			Date Pr	epared: 1	1/13/2009 0746	
Aluminum	290		ug/L	39	100	1.0
Chromium	36		ug/L	1.3	5.0	1.0
Sodium	74000		ug/L	250	2000	1.0

Mr. Steven Morrow Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID: Lab Sample ID:

OC-SW-18R

360-25577-6

Date Sampled:

11/12/2009 1020

Date Received: 11/12/2009 1645

Client Matrix:

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed: 11/1:	3/2009 1553	
Nitrate as N	ND	mg/L	0.050	0.050	1.0
Nitrite as N	ND	mg/L	0.010	0.010	1.0
Method: 300.0		Date Anal	yzed: 11/1:	3/2009 1608	
Sulfate	140	mg/L	20	20	10
Chloride	110	mg/L	10	10	10
Method: L107-06-1B		Date Anal	yzed: 11/2	4/2009 1616	
Prep Method: Distill/Ammonia		Date Prep	ared: 11/2	4/2009 1333	
Ammonia	36 <b>T</b>	mg/L	0.50	0.50	5.0
Method: SM 2510B		Date Anal	yzed: 11/1	3/2009 0938	
Specific Conductance	800	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID:

OC-SW-18R-DUP

Lab Sample ID:

360-25577-7

Date Sampled:

11/12/2009 1020

Date Received: 11/12/2009 1645

Client Matrix:

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Ar	nalyzed:	11/13/2009 1542	
Aluminum	84 J	ug/L	39	100	1.0
Chromium	13	ug/L	1.3	5.0	1.0
Sodium	83000 5	ug/L	250	2000	1.0
Method: 6010B		Date Ar	nalyzed:	11/13/2009 1455	
Prep Method: 3010A		Date Pr	repared:	11/13/2009 0746	
Aluminum	280	ug/L	39	100	1.0
Chromium	34	ug/L	1.3	5.0	1.0
Sodium	71000 🦪	ug/L	250	2000	1.0

Mr. Steven Morrow Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID:

OC-SW-18R-DUP

Lab Sample ID:

360-25577-7

Date Sampled:

11/12/2009 1020

Date Received: 11/12/2009 1645

Client Matrix:

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	yzed: 11	/13/2009 1956	
Nitrate as N	ND	mg/L	0.050	0.050	1.0
Nitrite as N	ND	mg/L	0.010	0.010	1.0
Method: 300.0		Date Anal	yzed: 11	/13/2009 2011	
Sulfate	150	mg/L	20	20	10
Chloride	110	mg/L	10	10	10
Method: L107-06-1B		Date Anal	yzed: 11	/24/2009 1621	
Prep Method: Distill/Ammonia		Date Prep	ared: 11	/24/2009 1333	
Ammonia	33 5	mg/L	0.50	0.50	5.0
Method: SM 2510B		Date Anal	yzed: 11	/13/2009 0939	
Specific Conductance	800	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312-4441

Client Sample ID:

OC-SW-ISCO1

Lab Sample ID:

360-25577-8

Date Sampled:

11/12/2009 1050

Date Received: 11/12/2009 1645

Client Matrix:

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Ar	nalyzed: 11/1	3/2009 1545	
Aluminum	73 J	ug/L	39	100	1.0
Chromium	12	ug/L	1.3	5.0	1.0
Sodium	81000 🔰	ug/L	250	2000	1.0
Method: 6010B		Date Ar	nalyzed: 11/1	3/2009 1459	
Prep Method: 3010A		Date Pr	repared: 11/1	3/2009 0746	
Aluminum	280	ug/L	39	100	1.0
Chromium	34	ug/L	1.3	5.0	1.0
Sodium	71000 🕤	ug/L	250	2000	1.0

Mr. Steven Morrow Job Number: 360-25577-1 Olin Corporation

3855 North Ocoee Street

Suite 200

Cleveland, TN 37312-4441

Client Sample ID: Lab Sample ID:

OC-SW-ISCO1 360-25577-8

Date Sampled:

11/12/2009 1050

Date Received: 11/12/2009 1645

Client Matrix:

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Anal	lyzed: 11/1	3/2009 2026	
Nitrate as N	ND	mg/L	0.050	0.050	1.0
Nitrite as N	ND	mg/L	0.010	0.010	1.0
Method: 300.0		Date Anal	lyzed: 11/1	3/2009 2041	
Sulfate	150	mg/L	20	20	10
Chloride	120	mg/L	10	10	10
Method: L107-06-1B		Date Ana	lyzed: 11/2	4/2009 1622	
Prep Method: Distill/Ammonia		Date Prep	pared: 11/2	4/2009 1333	
Ammonia	33 ブ	mg/L	1.0	1.0	10
Method: SM 2510B		Date Ana	lyzed: 11/1	3/2009 0941	
Specific Conductance	790	umhos/cm	1.0	1.0	1.0

# **DATA REPORTING QUALIFIERS**

Lab Section	Qualifier	Description
Metals		
	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
General Chemistry		
	F	MS or MSD exceeds the control limits

# **QUALITY CONTROL RESULTS**

Client: Olin Corporation Job Number: 360-25577-1

# **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 360-51587					
_CS 360-51587/2-A	Lab Control Sample	Т	Water	3010A	
_CSD 360-51587/3-A	Lab Control Sample Duplicate	Т	Water	3010A	
MB 360-51587/1-A	Method Blank	Т	Water	3010A	
360-25577-1	OC-SW-ISCO3	Т	Water	3010A	
360-25577-2	OC-SW-ISCO2	Т	Water	3010A	
360-25577-3	OC-SW-PZ16RR	Т	Water	3010A	
360-25577-4	OC-SW-PZ17RR	Т	Water	3010A	
360-25577-5	OC-SW-SD17	Т	Water	3010A	
360-25577-6	OC-SW-18R	Т	Water	3010A	
360-25577-6MS	Matrix Spike	Т	Water	3010A	
860-25577-6MSD	Matrix Spike Duplicate	Т	Water	3010A	
360-25577-7	OC-SW-18R-DUP	Ť	Water	3010A	
360-25577-8	OC-SW-ISCO1	T	Water	3010A	
Analysis Batch:360-5165	0				
.CS 360-51587/2-A	Lab Control Sample	Т	Water	6010B	360-51587
CSD 360-51587/3-A	Lab Control Sample Duplicate	T T	Water	6010B	360-51587
MB 360-51587/1-A	Method Blank	T.	Water	6010B	360-51587
60-25577-1	OC-SW-ISCO3	T T	Water	6010B	360-51587
60-25577-2	OC-SW-ISCO2	T.	Water	6010B	360-51587
60-25577-3	OC-SW-PZ16RR	T.	Water	6010B	360-51587
360-25577-4	OC-SW-PZ17RR	T.	Water	6010B	360-51587
360-25577-5	OC-SW-SD17	Ť	Water	6010B	360-51587
360-25577-6	OC-SW-18R	T.	Water	6010B	360-51587
860-25577-6MS	Matrix Spike	T T	Water	6010B	360-51587
860-25577-6MSD	Matrix Spike Duplicate	Ť	Water	6010B	360-51587
360-25577-7	OC-SW-18R-DUP	Ť	Water	6010B	360-51587
360-25577-8	OC-SW-ISCO1	Ť	Water	6010B	360-51587
Analysis Batch:360-5167	4				
.CS 360-51674/20	Lab Control Sample	Т	Water	6010B	
CSD 360-51674/27	Lab Control Sample Duplicate	T.	Water	6010B	
MB 360-51674/21	Method Blank	T.	Water	6010B	
360-25577-1	OC-SW-ISCO3	D	Water	6010B	
360-25577-2	OC-SW-ISCO2	D	Water	6010B	
360-25577-3	OC-SW-PZ16RR	D	Water	6010B	
360-25577-4	OC-SW-PZ17RR	D	Water	6010B	
60-25577-5	OC-SW-SD17	D	Water	6010B	
360-25577-6	OC-SW-18R	D	Water	6010B	
860-25577-6MS	Matrix Spike	D	Water	6010B	
60-25577-6MSD	Matrix Spike Duplicate	D	Water	6010B	
360-25577-7	OC-SW-18R-DUP	D	Water	6010B	
360-25577-8	OC-SW-ISCO1	D	Water	6010B	

Client: Olin Corporation Job Number: 360-25577-1

# **QC Association Summary**

Report

Lab Sample ID Client Sample ID Basis Client Matrix Method Prep Batch

### Report Basis

D = Dissolved

T = Total

Client: Olin Corporation Job Number: 360-25577-1

# **QC Association Summary**

ab Sample ID  General Chemistry	Client Sample ID	Basis		Method	Prep Batch
			Client Matrix	mourou	. Top Date.
Analysis Batch:360-51614 CS 360-51614/10	Lab Control Sample	т	Water	SM 2510B	
1B 360-51614/3	Method Blank	Ť	Water	SM 2510B	
60-25577-1	OC-SW-ISCO3	Ť	Water	SM 2510B	
60-25577-1DU	Duplicate	Ť	Water	SM 2510B	
60-25577-1DG 60-25577-2	OC-SW-ISCO2	Ť	Water	SM 2510B	
60-25577-3	OC-SW-PZ16RR	T	Water	SM 2510B	
60-25577-4	OC-SW-PZ17RR	T T	Water	SM 2510B	
60-25577-5	OC-SW-SD17	T T	Water	SM 2510B	
60-25577-6	OC-SW-18R	T T	Water	SM 2510B	
60-25577-0 60-25577-7	OC-SW-18R-DUP	Ť	Water	SM 2510B	
60-25577-8	OC-SW-ISCO1	Ť	Water	SM 2510B	
UU-23311-0	00-344-13001	ı	vvalei	31VI 23 IUD	
Analysis Batch:360-51682					
CS 360-51682/4	Lab Control Sample	T	Water	300.0	
IB 360-51682/3	Method Blank	T	Water	300.0	
60-25577-1	OC-SW-ISCO3	T	Water	300.0	
60-25577-2	OC-SW-ISCO2	T	Water	300.0	
60-25577-3	OC-SW-PZ16RR	Т	Water	300.0	
60-25577-4	OC-SW-PZ17RR	Т	Water	300.0	
60-25577-5	OC-SW-SD17	Т	Water	300.0	
60-25577-6	OC-SW-18R	Т	Water	300.0	
60-25577-6MS	Matrix Spike	T	Water	300.0	
60-25577-6MSD	Matrix Spike Duplicate	T	Water	300.0	
60-25577-7	OC-SW-18R-DUP	Т	Water	300.0	
60-25577-8	OC-SW-ISCO1	Т	Water	300.0	
Analysis Batch:360-51684					
CS 360-51684/4	Lab Control Sample	Т	Water	300.0	
1B 360-51684/3	Method Blank	T T	Water	300.0	
60-25577-1	OC-SW-ISCO3	T T	Water	300.0	
60-25577-1	OC-SW-ISCO2	Ť	Water	300.0	
60-25577-2 60-25577-3	OC-SW-PZ16RR	T T	Water	300.0	
60-25577-4	OC-SW-PZ17RR	Ť	Water	300.0	
60-25577 <i>-</i> 4	OC-SW-SD17	Ť	Water	300.0	
60-25577-6	OC-SW-18R	Ť	Water	300.0	
60-25577-6MS	Matrix Spike	Ť	Water	300.0	
60-25577-6MSD	Matrix Spike  Matrix Spike Duplicate	T T	Water	300.0	
60-25577-0WSD	OC-SW-18R-DUP	T	Water	300.0	
60-25577-8	OC-SW-18R-DUP OC-SW-ISCO1	, T	Water	300.0	

Client: Olin Corporation Job Number: 360-25577-1

# **QC Association Summary**

Olivert Overesty ID	Report Basis	Oli and Madelin		Davis Datab
Client Sample ID	Dasis	Client Matrix	Method	Prep Batch
Lab Control Sample	Т	Water	Distill/Ammonia	
Method Blank	Т	Water	Distill/Ammonia	
OC-SW-ISCO3	Т	Water	Distill/Ammonia	
OC-SW-ISCO2	Т	Water	Distill/Ammonia	
OC-SW-PZ16RR	Т	Water	Distill/Ammonia	
OC-SW-PZ17RR	Т	Water	Distill/Ammonia	
OC-SW-SD17	Т	Water	Distill/Ammonia	
OC-SW-18R	Т	Water	Distill/Ammonia	
Matrix Spike	Т	Water	Distill/Ammonia	
Matrix Spike Duplicate	Т	Water	Distill/Ammonia	
OC-SW-18R-DUP	Т	Water	Distill/Ammonia	
OC-SW-ISCO1	Т	Water	Distill/Ammonia	
7				
Lab Control Sample	Т	Water	L107-06-1B	360-52128
Method Blank	T	Water	L107-06-1B	360-52128
OC-SW-ISCO3	Т	Water	L107-06-1B	360-52128
OC-SW-ISCO2	Т	Water	L107-06-1B	360-52128
OC-SW-PZ16RR	Т	Water	L107-06-1B	360-52128
OC-SW-PZ17RR	Т	Water	L107-06-1B	360-52128
OC-SW-SD17	Т	Water	L107-06-1B	360-52128
OC-SW-18R	Т	Water	L107-06-1B	360-52128
Matrix Spike	Т	Water	L107-06-1B	360-52128
Matrix Spike Duplicate	Т	Water	L107-06-1B	360-52128
OC-SW-18R-DUP	T	Water	L107-06-1B	360-52128
OC-SW-ISCO1	Т	Water	L107-06-1B	360-52128
	Lab Control Sample Method Blank OC-SW-ISCO3 OC-SW-ISCO2 OC-SW-PZ16RR OC-SW-PZ17RR OC-SW-SD17 OC-SW-18R Matrix Spike Matrix Spike Duplicate OC-SW-ISCO1  Lab Control Sample Method Blank OC-SW-ISCO3 OC-SW-ISCO3 OC-SW-PZ16RR OC-SW-PZ16RR OC-SW-PZ17RR OC-SW-PZ17RR OC-SW-PZ17RR OC-SW-SD17 OC-SW-18R Matrix Spike Duplicate OC-SW-18R-DUP	Lab Control Sample T  Method Blank T  OC-SW-ISCO3 T  OC-SW-ISCO2 T  OC-SW-PZ16RR T  OC-SW-PZ17RR T  OC-SW-SD17 T  OC-SW-18R T  Matrix Spike Duplicate T  OC-SW-ISCO1 T  Lab Control Sample T  Method Blank T  OC-SW-ISCO3 T  OC-SW-ISCO3 T  OC-SW-ISCO3 T  OC-SW-PZ16RR T  Method Blank T  OC-SW-ISCO3 T  OC-SW-PZ16RR T  OC-SW-PZ17RR T  OC-SW-PZ17RR T  OC-SW-PZ17RR T  OC-SW-PZ17RR T  OC-SW-PZ17RR T  OC-SW-SD17 T  OC-SW-SD17 T  OC-SW-18R T  Matrix Spike Duplicate T  Matrix Spike Duplicate T  OC-SW-18R-DUP T	Lab Control Sample  Method Blank  OC-SW-ISCO3  T Water  OC-SW-ISCO2  T Water  OC-SW-PZ16RR  T Water  OC-SW-PZ17RR  T Water  OC-SW-SD17  OC-SW-18R  Matrix Spike  Matrix Spike  DUP  T Water  OC-SW-ISCO1  T Water  Method Blank  T Water  OC-SW-ISCO3  T Water  OC-SW-ISCO3  T Water  OC-SW-ISCO2  T Water  OC-SW-PZ16RR  T Water  OC-SW-PZ17RR  T Water  OC-SW-PZ17RR  T Water  OC-SW-PZ17RR  T Water  OC-SW-SD17  T Water  OC-SW-SD17  T Water  OC-SW-ISCO3  T Water  OC-SW-SD17  T Water  OC-SW-SD17  T Water  OC-SW-SD17  T Water  OC-SW-ISCO2  T Water  OC-SW-SD17  T Water  OC-SW-SD17  T Water  OC-SW-SD17  T Water  OC-SW-ISCO2  T Water  OC-SW-SD17  T Water  OC-SW-ISCO3  T Water  OC-SW-SD17  T Water  OC-SW-ISCO3  T Water  OC-SW-SD17  T Water  OC-SW-ISCO3  T Water  OC-SW-SD17  T Water  OC-SW-SD17  T Water  OC-SW-ISCO3  T Water  OC-SW-ISCO3  T Water  OC-SW-SD17  T Water  OC-SW-SD17  T Water  OC-SW-ISCO3  T WATE	Lab Control Sample T Water Distill/Ammonia Method Blank T Water Distill/Ammonia OC-SW-ISCO3 T Water Distill/Ammonia OC-SW-ISCO2 T Water Distill/Ammonia OC-SW-PZ16RR T Water Distill/Ammonia OC-SW-PZ16RR T Water Distill/Ammonia OC-SW-PZ17RR T Water Distill/Ammonia OC-SW-SD17 T Water Distill/Ammonia OC-SW-SD17 T Water Distill/Ammonia Matrix Spike T Water Distill/Ammonia Matrix Spike T Water Distill/Ammonia OC-SW-18R-DUP T Water Distill/Ammonia OC-SW-18R-DUP T Water Distill/Ammonia OC-SW-ISCO1 T Water Distill/Ammonia OC-SW-ISCO1 T Water Distill/Ammonia OC-SW-ISCO1 T Water L107-06-1B OC-SW-ISCO3 T Water L107-06-1B OC-SW-ISCO3 T Water L107-06-1B OC-SW-PZ16RR T Water L107-06-1B OC-SW-PZ16RR T Water L107-06-1B OC-SW-PZ17RR T Water L107-06-1B OC-SW-PZ17RR T Water L107-06-1B OC-SW-SD17 T Water L107-06-1B OC-SW-SD17 T Water L107-06-1B Matrix Spike Duplicate T Water L107-06-1B

# Report Basis

T = Total

Client: Olin Corporation Job Number: 360-25577-1

Method: 6010B Method Blank - Batch: 360-51587 Preparation: 3010A

Lab Sample ID: MB 360-51587/1-A Analysis Batch: 360-51650 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: 360-51587 Lab File ID: N/A

Dilution: 1.0 Units: ug/L Initial Weight/Volume:

50 mL 11/13/2009 1348 Date Analyzed: Final Weight/Volume: 50 mL Date Prepared: 11/13/2009 0746

RL Analyte Result Qual MDL ND 39 100 Aluminum Chromium ND 1.3 5.0 Sodium ND 250 2000

Lab Control Sample/ Method: 6010B Lab Control Sample Duplicate Recovery Report - Batch: 360-51587 Preparation: 3010A

LCS Lab Sample ID: LCS 360-51587/2-A Analysis Batch: 360-51650 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: 360-51587 Lab File ID: N/A

Dilution: 1.0 Units: ug/L Initial Weight/Volume:

50 mL 11/13/2009 1351 Final Weight/Volume: 50 mL Date Analyzed: 11/13/2009 0746 Date Prepared:

LCSD Lab Sample ID: LCSD 360-51587/3-A Varian 720 ES ICP Analysis Batch: 360-51650 Instrument ID:

Client Matrix: Water Prep Batch: 360-51587 Lab File ID: N/A

Dilution: 1.0 Units: ug/L Initial Weight/Volume: 50 mL

11/13/2009 1354 Date Analyzed: Final Weight/Volume: 50 mL Date Prepared: 11/13/2009 0746

% Rec. LCS RPD Analyte LCSD Limit RPD Limit LCS Qual LCSD Qual Aluminum 97 95 80 - 120 1 20 Chromium 100 80 - 120 20 99 1 Sodium 96 80 - 120 20 94 2

Calculations are performed before rounding to avoid round-off errors in calculated results.

50 mL

Client: Olin Corporation Job Number: 360-25577-1

Matrix Spike/ Method: 6010B

Matrix Spike Duplicate Recovery Report - Batch: 360-51587 Preparation: 3010A

MS Lab Sample ID: 360-25577-6 Analysis Batch: 360-51650 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: 360-51587 Lab File ID: N/A

Dilution: 1.0 Initial Weight/Volume:

 Date Analyzed:
 11/13/2009
 1449
 Final Weight/Volume:
 50 mL

 Date Prepared:
 11/13/2009
 0746

MSD Lab Sample ID: 360-25577-6 Analysis Batch: 360-51650 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: 360-51587 Lab File ID: N/A

Dilution: 1.0 Initial Weight/Volume: 50 mL

 Date Analyzed:
 11/13/2009 1452
 Final Weight/Volume:
 50 mL

 Date Prepared:
 11/13/2009 0746

% Rec. RPD Analyte MS MSD Limit **RPD Limit** MS Qual MSD Qual Aluminum 75 - 125 96 101 4 20 75 - 125 Chromium 97 101 4 20 Sodium 78 105 75 - 125 6 20

Client: Olin Corporation Job Number: 360-25577-1

Method Blank - Batch: 360-51674 Method: 6010B
Preparation: N/A

Lab Sample ID: MB 360-51674/21 Analysis Batch: 360-51674 Instrument ID: Varian 720 ES ICP Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: ug/L Initial Weight/Volume:

Date Analyzed: 11/13/2009 1444 Final Weight/Volume: 1.0 mL Date Prepared: N/A

RL Analyte Result Qual MDL ND 39 100 Aluminum Chromium ND 1.3 5.0 Sodium ND 250 2000

Lab Control Sample/ Method: 6010B
Lab Control Sample Duplicate Recovery Report - Batch: 360-51674 Preparation: N/A

LCS Lab Sample ID: LCS 360-51674/20 Analysis Batch: 360-51674 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A
Dilution: 1.0 Units: ug/L Initial Weight/Volume:

Date Analyzed: 11/13/2009 1441 Final Weight/Volume: 10 mL

Date Prepared: N/A

LCSD Lab Sample ID: LCSD 360-51674/27 Analysis Batch: 360-51674 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A
Dilution: 1.0 Units: ug/L Initial Weight/Volume:

Date Analyzed: 11/13/2009 1517 Final Weight/Volume: 10 mL

Date Prepared: N/A

% Rec. LCS RPD Analyte LCSD Limit RPD Limit LCS Qual LCSD Qual Aluminum 94 98 80 - 120 5 20 Chromium 97 80 - 120 2 20 100 Sodium 95 80 - 120 20 98 3

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Olin Corporation Job Number: 360-25577-1

Matrix Spike/ Method: 6010B
Matrix Spike Duplicate Recovery Report - Batch: 360-51674 Preparation: N/A

MS Lab Sample ID: 360-25577-6 Analysis Batch: 360-51674 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 11/13/2009 1505 Final Weight/Volume: 10 mL Date Prepared: N/A

MSD Lab Sample ID: 360-25577-6 Analysis Batch: 360-51674 Instrument ID: Varian 720 ES ICP

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Initial Weight/Volume:

Date Analyzed: 11/13/2009 1508 Final Weight/Volume: 10 mL

Date Prepared: N/A

% Rec. RPD Analyte MS MSD Limit **RPD Limit** MS Qual MSD Qual Aluminum 75 - 125 97 98 20 1 75 - 125 Chromium 97 98 1 20 Sodium 76 76 75 - 125 0 20 4

1.0 mL

Client: Olin Corporation Job Number: 360-25577-1

Method Blank - Batch: 360-51682 Method: 300.0

Preparation: N/A

Lab Sample ID: MB 360-51682/3 Analysis Batch: 360-51682 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL

Date Analyzed: 11/13/2009 1522 Final Weight/Volume: 1.0 mL Date Prepared: N/A

 Analyte
 Result
 Qual
 RL
 RL

 Nitrate as N
 ND
 0.050
 0.050

 Nitrite as N
 ND
 0.010
 0.010

Lab Control Sample - Batch: 360-51682 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-51682/4 Analysis Batch: 360-51682 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume:

Date Analyzed: 11/13/2009 1538 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual Nitrate as N 4.00 85 - 115 4.18 105 Nitrite as N 4.00 85 - 115 4.06 101

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Olin Corporation Job Number: 360-25577-1

Matrix Spike/ Method: 300.0

Matrix Spike Duplicate Recovery Report - Batch: 360-51682 Preparation: N/A

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MS Lab Sample ID: 360-25577-6 Analysis Batch: 360-51682 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 10 Initial Weight/Volume: 1.0 mL

Date Analyzed: 11/13/2009 1623 Final Weight/Volume: 10 mL

Date Prepared: N/A

MSD Lab Sample ID: 360-25577-6 Analysis Batch: 360-51682 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 10 Initial Weight/Volume: 1.0 mL

Date Analyzed: 11/13/2009 1638 Final Weight/Volume: 10 mL

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 MS
 MSD
 Limit
 RPD
 RPD Limit
 MS Qual
 MSD Qual

 Nitrate as N
 114
 114
 75 - 125
 0
 20

75 - 125

0

20

Date Prepared:

Nitrite as N

N/A

Client: Olin Corporation Job Number: 360-25577-1

Method Blank - Batch: 360-51684 Method: 300.0 Preparation: N/A

Lab Sample ID: Analysis Batch: 360-51684 MB 360-51684/3 Instrument ID: No Equipment Assigned Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: mg/L Initial Weight/Volume: 1.0 mL Date Analyzed: 11/13/2009 1522 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Result RL RL Analyte Qual Sulfate ND 2.0 2.0 Chloride ND 1.0 1.0

Lab Control Sample - Batch: 360-51684 Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-51684/4 Analysis Batch: 360-51684 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: Units: mg/L Initial Weight/Volume: 1.0 1.0 mL

Date Analyzed: 11/13/2009 1538 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit Qual 80.0 85 - 115 Sulfate 83.7 105 40.0 85 - 115

40.7

102

Calculations are performed before rounding to avoid round-off errors in calculated results.

Chloride

1.0 mL

Client: Olin Corporation Job Number: 360-25577-1

Matrix Spike/ Method: 300.0

Matrix Spike Duplicate Recovery Report - Batch: 360-51684 Preparation: N/A

MS Lab Sample ID: 360-25577-6 Analysis Batch: 360-51684 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 10 Initial Weight/Volume:

Date Analyzed: 11/13/2009 1623 Final Weight/Volume: 10 mL

Date Prepared: N/A

MSD Lab Sample ID: 360-25577-6 Analysis Batch: 360-51684 Instrument ID: No Equipment Assigned

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 10 Initial Weight/Volume: 1.0 mL

Date Analyzed: 11/13/2009 1638 Final Weight/Volume: 10 mL

Date Prepared: N/A

% Rec. RPD Analyte MS MSD Limit **RPD Limit** MS Qual MSD Qual Sulfate 75 - 125 119 20 119 0 Chloride 119 119 75 - 125 0 20

Client: Olin Corporation

Job Number: 360-25577-1

Method Blank - Batch: 360-52128

Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID:

MB 360-52128/1-A

Instrument ID:

No Equipment Assigned

Client Matrix:

Water

Analysis Batch: 360-52157 Prep Batch: 360-52128

Lab File ID:

Dilution:

1.0

Initial Weight/Volume:

1.0 mL

Date Analyzed:

11/24/2009 1533

Units: mg/L

Final Weight/Volume:

50 mL

Date Prepared:

11/24/2009 1333

Result

Qual

RL

RL

Analyte Ammonia

0.10

0.10

ND

Lab Control Sample - Batch: 360-52128

Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID:

LCS 360-52128/2-A

Analysis Batch: 360-52157

Instrument ID:

No Equipment Assigned

Client Matrix:

Water

Prep Batch: 360-52128

Lab File ID:

N/A

Dilution:

1.0

Units: mg/L

Initial Weight/Volume:

1.0 mL

Date Analyzed: Date Prepared:

11/24/2009 1534 11/24/2009 1333

Final Weight/Volume:

50 mL

Analyte

Spike Amount

Result

% Rec.

Limit

Qual

Ammonia

10.0

10.3

103

85 - 115

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-52128

Method: L107-06-1B

Preparation: Distill/Ammonia

N/A

MS Lab Sample ID:

360-25577-6

Analysis Batch: 360-52157

Instrument ID:

Client Matrix:

Water

Prep Batch: 360-52128

Lab File ID:

No Equipment Assigned

Dilution:

10

Initial Weight/Volume:

1.0 mL

Date Analyzed:

Date Prepared:

11/24/2009 1617

Final Weight/Volume:

50 mL

MSD Lab Sample ID:

360-25577-6

Analysis Batch: 360-52157

Instrument ID: No Equipment Assigned

Client Matrix:

Dilution:

Water

Prep Batch: 360-52128

MSD

Lab File ID: Initial Weight/Volume:

1.0 mL

F

Date Analyzed: Date Prepared: 10

11/24/2009 1620 11/24/2009 1333

11/24/2009 1333

Final Weight/Volume:

50 mL

Analyte

% Rec. MS 55

Limit

RPD 13

RPD Limit

MS Qual MSD Qual

Ammonia

75 - 125 115

20

Calculations are performed before rounding to avoid round-off errors in calculated results.

Qual

Client: Olin Corporation Job Number: 360-25577-1

Method Blank - Batch: 360-51614 Method: SM 2510B

Preparation: N/A

Lab Sample ID: MB 360-51614/3 Analysis Batch: 360-51614 Instrument ID: MAN-TECH Ion Plus

Client Matrix: Water Prep Batch: N/A Lab File ID: N/A
Dilution: 1.0 Units: umhos/cm Initial Weight/Volume:

Date Analyzed: 11/13/2009 0854 Final Weight/Volume: 1.0 mL Date Prepared: N/A

Analyte Result Qual RL RL

Analyte Result Qual RL RL
Specific Conductance ND 1.0 1.0

Lab Control Sample - Batch: 360-51614 Method: SM 2510B Preparation: N/A

Lab Sample ID: LCS 360-51614/10 Analysis Batch: 360-51614 Instrument ID: MAN-TECH Ion Plus Client Matrix: Water Prep Batch: N/A Lab File ID: N/A

Dilution: 1.0 Units: umhos/cm Initial Weight/Volume:

Date Analyzed: 11/13/2009 0928 Final Weight/Volume: 1.0 mL Date Prepared: N/A

Analyte Spike Amount Result % Rec. Limit

 Specific Conductance
 1410
 1380
 98
 85 - 115

Duplicate - Batch: 360-51614 Method: SM 2510B Preparation: N/A

Lab Sample ID: 360-25577-1 Analysis Batch: 360-51614 Instrument ID: MAN-TECH Ion Plus Autotitral

Client Matrix:WaterPrep Batch: N/ALab File ID: N/ADilution:1.0Units: umhos/cmInitial Weight/Volume:

Date Analyzed: 11/13/2009 0931 Final Weight/Volume: 1.0 mL

Date Prepared: N/A

Analyte Sample Result/Qual Result RPD Limit Qual
Specific Conductance 650 650 0 20

Calculations are performed before rounding to avoid round-off errors in calculated results.

## **State Accreditation Matrix**

		Creditation Matrix State where Primary Accreditation is Carried									
		New York	Florida								
Method Name	Description	(NELAC)	Mass	Conn	(NELAC)	North Carolina					
821-R-02-012	Toxicity, Acute (48-Hour)(list upon request)				NP						
SM 4500 CI F	Chlorine, Residual		NP								
SM 9215B	Heterotrophic Plate Count (Pour Plate Method)		Р								
SM 9215E	Heterotrophic Plate Count (SimPlate)		Р								
SM 9221F	E.Coli (Multiple-Tube Fermentation; EC-MUG)		Р								
SM 9222B	Coliforms, Total (Membrane Filter)		Р								
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP								
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)	110/0	P	ND/D							
200.8	Metals (ICP/MS) (list upon request)	NP/P	NP/P	NP/P							
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	NP/P							
6010B	Metals (ICP)(list upon request)	NP/SW	NB	NP/SW							
245.1	Mercury (CVAA)	NP/P	NP	NP/P							
7470A	Mercury (CVAA)	NP		NP							
7471A	Mercury (CVAA)	SW ND/D	ND	SW		1					
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P							
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P							
3010A	Preparation, Total Metals	NP/P		NP/P							
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW		+					
3050B	Preparation, Metals	SW	-	SW		<del>                                     </del>					
504.1	EDB, DBCP and 1,2,3-TCP (GC)	NP	P NP	P		+					
608	Organochlorine Pest/PCBs (list upon request)		NP	NP		ļ					
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP SW		NP		+					
3546	Microwave Extraction	SW		NID							
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		NP							
3540C	Soxhlet Extraction	014		0)4/							
3550B	Ultrasonic Extraction	SW	NB	SW							
600/4-81-045	Polychlorinated Biphenyls (PCBs) (GC)	ND/OW	NP	NP NP/OW/							
8081A	Organochlorine Pesticides (GC)(list upon request)	NP/SW		NP/SW							
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW							
8270C	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW							
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)			NP/SW		ND/OW/					
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)			NP/SW		NP/SW					
524.2	Volatile Org Comp (GC/MS)(list upon request)	Р	P P	P P		ļ					
524.2	Trihalomethanes	NP	NP	NP		1					
624	Volatile Org Comp (GC/MS)(list upon request)	SW	INP	SW		1					
5035	Closed System Purge and Trap	NP		NP		1					
5030B	Purge and Trap					1					
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW NP/SW		NP/SW					
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)		P	P NP/SW		INP/SVV					
180.1	Turbidity, Nephelometric	ND/D	NP/P								
300	Anions, Ion Chromatography COD	NP/P NP	NP/P	NP/P NP		+					
410.4	Ignitability, Pensky-Martens Closed-Cup Method	SW	INF	SW							
1010 10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP	NP		+					
	Chromium, Hexavalent	NP/SW	INF	NP/SW		+					
7196A 9012A	Cyanide, Total and/or Amenable	NP/SW		NP/SW		<del> </del>					
	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		NP		+					
9030B	pH	NP		NP		+					
9040B 9045C	рн	SW		SW		+					
9045C L107041C	Nitrogen, Nitrate	NP	P	NP/P		+					
L107041C L107-06-1B	Nitrogen, Nitrate Nitrogen Ammonia	NP NP	NP	NP/P		+					
L204001A CN	Cyanide, Total	INF	NP/P	NP/P		+					
L210-001A	Phenolics, Total Recoverable	NP	NP	NP		+					
SM 2320B	Alkalinity	NP/P	NP/P	NP/P		+					
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P		+					
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P		+					
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	NP	I 	1					
SM 3500 CR D	Chromium, Hexavalent	NP		NP		+					
SM 4500 H+ B	pH	NP/P	NP/P	NP/P		+					
SM 4500 NO2 B	Nitrogen, Nitrite	NP	P	NP/P		+					
SM 4500 NO2 B	Phosphorus, Orthophosphate	NP/P	NP	NP/P		+					
SM 4500 P E	Phosphorus, Orthophosphate  Phosphorus, Total	NP NP	NP	NP		+					
SM 4500 P E SM 4500 S2 D	Sulfide, Total	NP	141	NP		+					
SM 5210B	BOD, 5-Day	NP	NP	NP		+					
OIVI JE TUD		NP	NP NP	NP/P		+					
SM 5310B	Organic Carbon, Total (TOC)										

Not all organic compounds are accreditied under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory

The lab carries additional accreditations with several states. This is listing is subject to change based on the laboratories current certification standing.

# **Login Sample Receipt Check List**

Client: Olin Corporation Job Number: 360-25577-1

Login Number: 25577 List Source: TestAmerica Westfield

Creator: Rinard, Kimberley A

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	0.6 C / 1.2 C / 5.2 C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified	True	

TestAmerica Laboratories, Inc. Chain of Custody Form

TestAmerica

 Southampton Road Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707

<b>PO#</b>	Comments	(Special Instructions)	MCP case narrative		-							Dissolved metals are field filtered.	Analysis Ammonia NitrogenLac 107-06-1B	Chloride/sulfateEPA 300 Specific ConductivitySM 2510B	Nitrate/NitriteEPA 300 48 hour hold time on NO2, NO3	To Hour Dolo	true for	Surfaceware				Cooler ? ②/ N Samples Icedスタ / N	Temp @ receipt: 0,6 12°c /5,2°c	Preservation/pH checked	By: Whe Date: 11 Police
Job# 360 255 77 Quote#	Shaded areas for office use	Analysis Requested Check analysis and specify method	and analytes in comments section. For example:	500-series for drinking water	oorsenes for waste water 8000-series for haz/solid waste	Use comments section to further define.					Other_ Other_ Other_ Other_ Other_									-			7027 9	Time:	
John 360.	Shaded ar	Analys Check analysis	and analytes in For example:		8000-series 10	1	XX	ivity B010B	ndut ite s by	ic Co , Mitr Cr/N:	Chloric Specifi Mitrate Diss Alv Tot Alv	XXXX	XXXXX	メメメメメ	XXXXX	X	XXXXX	XXXXX	XXXXX	X X X X X	XXXXX		Date: (((/2/0	Date: 11 12 09	tfield
4(		ater	Ĺ	Special Report Format	DEP Form(s)	MWRA Smart Rpt	MCP QA/QC Rpt	ervative	:2 \C C C	> Hq lq ot \NS\ \p \q \op \l	HCI to NaOH NOOH None	× -	<u>-</u>			-	ī.	<b>≠</b>	<del>-</del>	<del>-</del>	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	(	57	In	estAmerica-Westfield
Project #: 6107-09-0016-04	r: P. Thompson		Contact: David Chapman	-	Drinking Water	MCP GW1/S1			4 <5 GISS GISS	ianis 10 (9 M\4C 1q 01	Comp. # Cont Plastic( NaHSC H2SO	4 6 2 1	7 4	4 9 2 1	1 dh	1 2 dh	1 2 d h	7 0 5	4 p 2 i	1 2 d h	1 7 d h	Signature	Received by:	Received by	TestAm
Project #	Project Manager: P.	Work ID: St	Contac	Regulatory Classification	NPDES Drir		Other			Date	e ted Grab	O 8SE	112109	11/1409 V	60/21/11	~ Sooi	6 0201 50/21/11	<b>&gt;</b>	<u></u>	<u>&gt;</u>	1 30/21/11	7	Time:	Time: 7645	7
				Re			5 Day Ot	acewater	····	<u> </u>	Sample Type Sample slaisinl		Sw Olc	SW ONE	SW and	SW Prc	SW Ora	3. F	Sw OLC	38	न्न इ		Date: " [12/04	Control Contro	
Client: Olin Chemical/MACTEC	Address: 51 Fames Street	Wilmington, MA 01887	Phone: Fax:	equested Turn Aro	10 Busines's Day (Std) XX   Rush TAT Requested:		Other 48 hrs	Codes ater DW-Drinking water	LVV-Labwater CVV-Groundwater A-Alf S-Solid / Soil SL-Sludge O-Oil Z-Other		Sample ID	0c-5w-Ix03	5 0254-75-70 gg	8 OC-5W-D216AR		L105-M5-20	OC-5W-18R	0c-SW-18R-DUP	6c sw -18R-ms	OC-SW-18R-MSD	0C-SW-ISCO	Sampled by (print):	10	Relinquished by:	Method of Phipment:

Fage 1 of 7

White = Lab file Yellow = Report copy Pink = Customer copy STL-8245 (1000)